Commonwealth of Pennsylvania

DEPARTMENT OF AGRICULTURE

BULLETIN No. 229

PROCEEDINGS OF THE

Farmers' Annual Normal Institute

AND SPRING MEETING

State Board of Agriculture

COMPILED BY
A. L. MARTIN, *Director of Institutes*

HELD IN THE COURT HOUSE, TOWANDA, PA.
MAY 21 TO 24, 1912

HARRISBURG:
C. E. AUGHINBAUGH, PRINTER TO THE STATE OF PENNSYLVANIA.
1912

SUMMARY OF CONTENTS

	Page.
Preface,	3
Letter of Transmittal,	5
Members State Board of Agriculture,	7
Proceedings Spring Meeting Board of Agriculture,	11
List of County Chairmen,	31
List of Institute Lecturers,	33
Program Annual Normal Institute,	35
Preceedings Annual Normal Institute,	38
Address of Welcome, Hon. Wm. Maxwell,	40
Address of Welcome, Benj. Kuykendall,	43
Address of Welcome, G. E. Frost, Esq.,	44
Response to Addresses of Welcome, Hon. N. B. Critchfield,	45
Address, Hon. A. L. Martin,	48
Address, F. R. Stevens,	52
Organization for Soil Fertility, Dr. Thomas F. Hunt,	58
The Farmer and the Chestnut Blight, Prof. Samuel B. Detwiler,	71
Adjourned Meeting State Board of Agriculture,	78
Care and Management of the Orchard, F. H. Fassett,	82
Feeding and Management of Dairy Cows, Prof. H. E. Van Norman,	89
Livestock Sanitation, Dr. C. J. Marshall,	100
Address, Prof. Cochel,	111
Horse Breeding and Management, Dr. Carl W. Gay,	114
Home Hygiene, Miss Mary A. Burnite,	126
Address, Mrs. Charles Ott,	132
Rural Uplift, Mrs. E. E. Smith,	134
Sanitation and Hygiene in the Public Schools, Dr. A. L. Russell,	138
Better Methods of Agriculture, Dr. J. D. Detrich,	149
Importance of Field Workers for the Development of Better Methods in Agriculture, L. W. Lighty,	155
Address, R. P. Kester,	160
Address, Captain Ainey,	162
Use of Dynamite in Farm Operations, Williard Young,	163
Report of Committee on Co-operation,	165
Report of Special Committee on Legislation,	170
By-laws for Co-operative Associations,	170
Address, Henry W. Northup,	179
Some Methods of Finishing and Dressing Poultry, R. V. Mitchell,	193
Report of Committee on Resolutions,	169
Farm Buildings Built of Concrete, E. S. Fowler,	200

PREFACE

Commonwealth of Pennsylvania,
Department of Agriculture,

Harrisburg, Pa., July 5, 1912.

There is perhaps no source of information upon subjects relating to either practical or scientific agriculture that is so easily available as the Farmers' Institute, and whatever adds to the efficiency of these institutes is of paramount importance. The hope of increasing their usefulness to the farmers of the State has led to the establishment of what is known as the Farmers' Normal Institute, in which all institute managers and lecturers of the State come together once a year for consultation and instruction.

In order that the instruction given at these institutes may be available to the greatest possible number, this Department publishes in bulletin form their proceedings, and so we send out the following bulletin, No. 229, containing the full proceedings of the Normal Institute held at Towanda, Pa., May 21-24, 1912, in the hope that it may prove helpful upon the many farms and in the many farmhouses to which it may come.

N. B. CRITCHFIELD,
Secretary of Agriculture.

LETTER OF TRANSMITTAL

Commonwealth of Pennsylvania,
Department of Agriculture,
Harrisburg, Pa., July 3, 1912.

Hon. N. B. Critchfield, Secretary of Agriculture:

Dear Sir: I have the honor to present herewith, bulletin of the Ninth Annual "Farmers' Normal Institute," which was held at Towanda, Pa., May 21 to 24, 1912.

Very respectfully,
A. L. MARTIN,
Director of Institutes.

MEMBERS

OF THE

PENNSYLVANIA
STATE BOARD OF AGRICULTURE

FOR THE YEAR 1912

MEMBERS EX-OFFICIO

HON. JOHN K. TENER, Governor.
HON. HENRY HOUCK, Secretary of Internal Affairs.
DR. N. C. SCHAEFFER, Superintendent of Public Instruction.
DR. EDWIN ERLE SPARKS, President of the State College.
HON. A. E. SISSON, Auditor General.
HON. N. B. CRITCHFIELD, Secretary of Agriculture.

APPOINTED BY THE GOVERNOR

Gen. James A. Beaver, Bellefonte, Centre County, ...Term expires 1913
R. H. Thomas, Jr., Mechanicsburg, Cumberland County, ...Term expires 1915

APPOINTED BY THE STATE POULTRY ASSOCIATION

.....

APPOINTED BY THE PENNSYLVANIA BRANCH OF THE AMERICAN POULTRY ASSOCIATION

W. Theo. Wittman, ...Allentown, ...1913

APPOINTED BY THE PENNSYLVANIA BEE-KEEPERS ASSOCIATION

William A. Selser, ...Philadelphia, ...1915

ELECTED BY COUNTY AGRICULTURAL SOCIETIES

			Term expires.
Adams, ...	A. I. Weidner, ...	Arendtsville, ...	1915
Allegheny, ...	A. J. Purdy, ...	Imperial, R. F. D. No. 1, ..	1915
Armstrong, ...	S. S. Blyholder, ...	Kelly Station, ...	1914
Beaver, ...	A. L. McKibben, ...	New Sheffield, ...	1914

			Term expires
Bedford,	Wm. F. Biddle,	Everett,	1915
Berks,	H. G. McGowan,	Geiger's Mills,	1913
Blair,	W. Frank Beck,	Altoona,	1914
Bradford,	F. D. Kerrick,	Towanda,	1913
Bucks,	B. Frank Wambold,	Sellersville,	1914
Butler,	W. H. Milliron,	Euclid,	1914
Cambria,	Jas. Westrick,	Patton, R. F. D. No. 2,	1913
Cameron,			
Carbon,			
Centre,	John A. Woodward,	Howard,	1915
Chester,	M. E. Conard,	Westgrove,	1915
Clarion,	J. H. Wilson,	Clarion,	1913
Clearfield,	Peter Gearhart,	Clearfield,	1913
Clinton,	J. A. Herr,	Millhall, R. F. D.,	1914
Columbia,			
Crawford,	J. S. Patton,	Hartstown,	1914
Cumberland,			
Dauphin,	Edward S. Keiper,	Middletown,	1914
Delaware,	E. J. Durnall,	Swarthmore,	1914
Elk,	John M. Wittman,	St. Mary's,	1915
Erie,			
Fayette,			
Forest,			
Franklin,	John P. Young,	Marion,	1914
Fulton,	J. L. Patterson,	McConnellsburg,	1913
Greene,	N. M. Biddle,	Carmichaels,	1913
Huntingdon,	Geo. G. Hutchison,	Warrior's Mark,	1915
Indiana,	S. C. George,	West Lebanon,	1913
Jefferson,	Peter B. Cowan,	Brookville,	1913
Juniata,	Matthew Rodgers,	Mexico,	1915
Lackawanna,	Horace Seamans,	Factoryville,	1913
Lancaster,	J. Aldus Herr,	Lancaster,	1914
Lawrence,	Sylvester Shaffer,	New Castle,	1913
Lebanon,	H. C. Snavely,	Cleona,	1913
Lehigh,	P. S. Fenstermaker,	Allentown,	1915
Luzerne,	J. E. Hildebrant,	Dallas R. F. D.,	1914
Lycoming,	A. J. Kahler,	Hughesville,	1915
McKean,	O. W. Abbey,	Turtle Point,	1913
Mercer,	W. C. Black,	Mercer,	1914
Mifflin,	M. M. Naginey,	Milroy,	1913
Monroe,	F. S. Brong,	Saylorsburg,	1913
Montgomery,	John H. Schultz,	Norristown,	1914
Montour,	J. Miles Derr,	Milton, R. F. D.,	1913
Northampton,	C. S. Messinger,	Tatamy,	1915
Northumberland,	I. A. Eschbach,	Milton, R. F. D.,	1914
*Perry,	A. T. Holman,	Millerstown,	1913
Philadelphia,	David Rust,	Philadelphia,	1913
Pike,	B. F. Killam,	Paupack,	1915
Potter,			
Schuylkill,	John Shoener,	New Ringgold,	1913
Snyder,			
Somerset,	John C. Weller,	Rockwood,	1914
Sullivan,	J. G. Cott,	Campbellsville,	1915
Susquehanna,	Frank A. Davies,	Montrose,	1913
Tioga,	Calvin H. DeWitt,	Mansfield,	1914
Union,	J. Newton Glover,	Vicksburg,	1914
Venango,			
Warren,	R. J. Weld,	Sugargrove,	1914
Washington,	D. S. Taylor,	Burgettstown,	1914
Wayne,	Warren E. Perham,	Pleasant Mount,	1914
Westmoreland,	M. P. Shoemaker,	Greensburg,	1913
Wyoming,	D. A. Knuppenburg,	Lake Carey,	1913
York,	G. F. Barnes,	Rossville,	1914

*Deceased.

OFFICERS

PRESIDENT

Hon. John K. Tener, Governor, ... Harrisburg

VICE PRESIDENTS

Horace Seamans, ... Factoryville
I. A. Eschbach, ... Milton, R. F. D.
John H. Schultz, ... Norristown

EXECUTIVE COMMITTEE

Dr. W. Frank Beck, Chairman, ... Altoona
M. M. Naginey, ... Milroy
P. S. Fenstermaker, ... Allentown
*A. T. Holman, ... Millerstown
Wm. F. Biddle, ... Everett, R. F. D.
H. C. Snavely, ... Cleona
Dr. M. E. Conard, ... Westgrove
D. S. Taylor, ... Burgettstown
W. C. Black, ... Mercer
N. B. Critchfield, Secretary, ... Harrisburg

ADVISORY COMMITTEE

Dr. M. E. Conard, ... Westgrove
*A. T. Holman, ... Millerstown
M. M. Naginey, ... Milroy

COMMITTEE ON RESOLUTIONS

Col. J. A. Woodward, Chairman, ... Howard
Matthew Rodgers, ... Mexico
Joel A. Herr, ... Millhall
M. P. Shoemaker, ... Greensburg
P. S. Fenstermaker, ... Allentown

CONSULTING SPECIALISTS

*Botanist, ...	Prof. W. A. Buckhout, ...	State College.
Pomologist, ...	Chester J. Tyson, ...	Floradale
Chemist, ...	Dr. Wm. Frear, ...	State College.
Veterinary Surgeon, ...	Dr. C. J. Marshall, ...	Harrisburg.
Sanitarian, ...	Dr W. Frank Beck, ...	Altoona.
Microcopist and Hygienist, ...	Prof. J. W. Kellogg, ...	Harrisburg.
Entomologist, ...	Prof. Franklin Menges, ...	York.
Ornithologist, ...	Prof. H. A. Surface, ...	Harrisburg.
Meteorologist, ...	E. R. Demain, ...	Harrisburg.
Mineralogist, ...	Dr. Isaac A. Harvey, ...	Lock Haven.
Apiarist, ...	H. C. Klinger, ...	Liverpool.
Economic Geologist, ...	Baird Halberstadt, ...	Pottsville.
Agricultural Geologist, ...	W. H. Stout, ...	Pinegrove.
Forests and Forestry, ...	Robert Conklin, ...	Harrisburg.
Feeding Stuffs, ...	G. G. Hutchison, ...	Warrior's Mark.

*Deceased.

STANDING COMMITTEES

LEGISLATION

J. H. Wilson, Chairman, ... Clarion
Peter Gearhart, ... Clearfield
E. J. Durnall, ... Swarthmore
S. S. Blyholder, ... Kelly Station
Calvin H. DeWitt, ... Mansfield

CEREALS AND CEREAL CROPS

J. Newton Glover, Chairman, ... Vicksburg

ROADS AND ROAD LAWS

J. L. Patterson, Chairman, ... McConnellsburg

FRUIT AND FRUIT CULTURE

Wm. F. Biddle, Chairman, ... Everett, R. F. D.

DAIRY AND DAIRY PRODUCTS

R. J. Weld, Chairman, ... Sugargrove

FERTILIZERS

J. Aldus Herr, Chairman, ... Lancaster

WOOL AND TEXTILE FIBERS

D. S. Taylor, Chairman, ... Burgettstown

LIVESTOCK

Dr. M. E. Conard, Chairman, ... Westgrove

POULTRY

W. Theo. Wittman, Chairman, ... Allentown

PROCEEDINGS OF THE SPRING MEETING OF THE PENNSYLVANIA STATE BOARD OF AGRICULTURE, HELD IN THE COURT HOUSE, TOWANDA, PA., May 21, 1912.

Towanda, Pa., Tuesday, May 21, 1912, 9.30 A. M.

Hon. N. B. Critchfield, Secretary of Agriculture, in the Chair.

The SECRETARY: The Board will please come to order. Is Mr. Seamans, the first Vice-President, in the room?

Mr. Seamans answered to his name.

The SECRETARY: Will you please take the Chair, Mr. Seamans.

Mr. Seamans took the Chair.

The CHAIRMAN: This is rather unexpected to me. I supposed, in my ignorance, that the Secretary took the Chair at the first meeting, and presided, and if you are thinking of hearing anything of any value from me at this time, I am afraid you will be disappointed. I don't know whether it is the same with you, or not, but with us, in our part of the State, the season is very backward, and the farmers have just fairly commenced their spring plowing. Very little seeding has been done, and scarcely any planting. I was called upon by the United States Government to make a report of the crops, weather, etc., the first day of May, and I think I reported that we had twenty-six days of rain in April, and so far, in May, the rainy weather has kept up until the present time.

Now, I believe the first thing on the program is roll-call. Will the Secretary please call the roll?

The Secretary called the roll, and to this and subsequent roll-calls the following members responded to their names:

Hon. N. B. Critchfield (Secretary and Ex-Officio Member); W. Theo. Wittman (Appointed by the Pennsylvania Branch of the American Poultry Association); A. I. Weidner, A. J. Purdy, S. S. Blyholder, W. F. Biddle, W. F. Beck, F. D. Kerrick, B. Frank Wambold, W. H. Milliron, Dr. M. E. Conard, J. A. Herr, A. P. Young, J. S. Patton, J. L. Patterson, N. M. Biddle, S. C. George, Peter B. Cowan, Matthew Rodgers, Horace Seamans, J. Aldus Herr, Sylvester Shaffer, P. S. Fenstermaker, J. E. Hildebrant, A. J. Kahler, W. C. Black, M. M. Naginey, F. S. Brong, John H. Schultz, C. S. Messinger, I. A. Eschbach, A. T. Holman, David Rust, B. F. Killam, John C. Weller, Frank A. Davies, Calvin H. DeWitt, J. Newton Glover, D. S. Taylor, War-

ren E. Perham, M. P. Shoemaker, D. A. Knuppenburg, and G. F. Barnes.

The SECRETARY: There is a quorum present, Mr. Chairman.

The CHAIRMAN: The next item is the reading of the minutes of the previous meeting.

MR KAHLER: I move that we dispense with the reading of the minutes.

This motion was properly seconded, and duly carried in the regular way.

The CHAIRMAN: The next is the appointment of the Committee on Credentials. I have not yet appointed this Committee; I should have it ready. How many is it the usual practice to appoint on this Committee, Mr. Secretary?

The SECRETARY: Five, usually.

The CHAIRMAN: May I have a moment or two to prepare this Committee?

The SECRETARY: Oh, certainly; we have plenty of time, Mr. Chairman.

The CHAIRMAN: I will appoint the following Committee on Credentials: Messrs. Joel A. Herr, A. P. Young, Frank A. Davies, A. I. Weidner and W. F. Biddle.

Any one having Credentials will please hand them to this Committee, who will act on them.

The SECRETARY: The next item will be the report of the Committee on Credentials. I think, therefore, it will be well to take a recess for a few minutes, which will give us a chance to visit among each other, or, if the Board chooses, to discuss any question we wish to take up.

MR. JOEL A. HERR: If there are any persons here having any credentials, please hand them in. There have none been sent in, so far.

I would like to ask the Secretary whether he knows anything of the withdrawal or resignation of Br. Cott? We have a copy of the credentials of Mr. Warburton from his county.

The SECRETARY: Not to my knowledge. I would prefer to leave it go over until the next meeting of the Board.

MR. JOEL A. HERR: The commission of Mr. E. R. Warburton bears the seal of the Society as its representative for three years commencing January, 1912. Now, we have another man elected from that county as a member of the Board, commencing January, 1912, and until he resigns, I do not see how we can act upon this credential.

The SECRETARY: I had intended to put with this credential a letter which is signed by the Secretary of the Sullivan County Agricultural Society, saying that Mr. Warburton had been appointed to take the place of Mr. Cott, who has never done anything, but I don't see that we can do anything unless the gentleman is here.

MR. JOEL A. HERR: I was at the Sullivan County Institutes last year, but Mr. Cott did not make his appearance. There was a general desire on the part of the people that Mr. Warburton represent them, although Mr. Cott had been elected.

DIRECTOR MARTIN: I recall some correspondence on the subject of making inquiry as to the eligibility of Mr. Warburton. The letter stated that Mr. Cott was inactive and had refused to do anything. I replied that Mr. Warburton was perfectly satisfactory—that is, so far as Institute work was concerned.

MR. JOEL A. HERR: I know a number of cases where the member of the Board does not conduct the Institutes. If there are no other credentials to act upon, I see no reason for calling the Committe together. So long as Mr. Cott has not resigned, we cannot act upon this credential. It is the personal opinion of a great many people, as well as my own, that Mr. Cott is inactive, but until he resigns, we can do nothing.

A Member: I move that this be laid on the table and referred back to the Society for the resignation of that member of the Board, and then this credential acted upon at the next meeting.

The SECRETARY: That motion, I think, is not quite as the gentleman wants to make it. I believe it would be better to authorize the Secretary to correspond with the Society and have the place declared vacant. The power that appoints has the power to declare the place vacant. That is one of the questions that is being very generally discussed; that is the recall.

MR. JOEL A. HERR: As a substitute for that motion, I move that the Secretary be authorized to correspond with the Sullivan County Agricultural Society with regard to this credential, and report at the next meeting of the Board.

This motion was properly seconded and duly carried in the regular way.

MR. JOEL A. HERR: Any other credentials to be handed in? I will call a meeting of the Committee if there are.

The SECRETARY: I think there is nothing further under this head.

MR. FENSTERMAKER: I think this Committee should come together, whether there are any credentials to be acted on or not. Take this thing of the expiration of the terms of the members of the Board. According to the printed list on the program, the term of R. I. Young

expired in 1911; that of Mr. Nevius in 1910; Lehigh in 1912. That is not correct; my term expires in 1915. The Credential Committee should look into this and have these things straightened out.

MR. JOEL A. HERR: The only person who is authorized to correct that is the Secretary himself.

MR. BLYHOLDER: I want to ask a question: Can a man be a member of the Board unless he attends the meetings?

MR. FENSTERMAKER: That is a very practical question. Some men never show their faces from year to year.

MR. JOEL A. HERR: As long as a man is elected for three years, he is a member of the Board for that length of time. Take the member from Greene county; he has served one term after another, and has not been present at all. That is not right; but he is a member of the Board until his term expires. It might be well to go over this list, as suggested by Mr. Fenstermaker, and go into the matter of the expiration of the terms. Take the list of those appointed by the Governor; one expires in 1911, one in 1913, and one in 1915. They are appointed for three years, not for one or two years, as this list has it. Now if this list were called, with the expirations, the Secretary could make a note of it, and see whether it is correct or not.

MR. BLYHOLDER: If the ruling of the Chairman of the Committee is correct, that a man is a member of the Board if he has been elected by the Society of his county, whether he serves or not, it seems to me that the time has come when this Board should make a new rule, that no man, whether elected by his Society or appointed by the Governor can become a member of the Board unless he expresses a willingness to attend its meetings, unless prevented by sickness.

MR. TAYLOR: Mr. Chairman, an illustration of the point in question is the late Charles H. Mullen of Cumberland county, who had been a member of the Board for over thirty years, and I don't think he attended half a dozen meetings. When he was first elected, he came occasionally, but for the last ten or twelve years he was never there. If we can correct this, it would be well to do so. We want only active men on this Board. Some of them are elected year after year by their Societies, for a lifetime, and feel no obligation to do anything.

MR. WELLER: Is a person supposed to be a member of the Board until his successor is elected?

The SECRETARY: The Act of Assembly, Mr. Chairman, says that the Agricultural Society of each county shall have the right to appoint a member to represent the county, and that the term shall be three years. There is nothing in the Act that will continue a man until his successor is appointed. Of course, that is the case with some public officials.

I don't know what was the purpose of these names appearing on the program, Mr. Martin, can you give me any light on the subject?

DIRECTOR MARTIN: It is simply a custom that has been followed for the last sixteen years. The idea of having the name put there was to show the member last elected and the expiration of his term, so that the attention of the Board would be called to the fact. We think it better to do this, rather than to leave the county blank, leaving the matter open to the discussion of the Board. The Chief Clerk, as you know, makes out this list, and we placed this list as made out, upon this program. I am conversant with the thought in the Chief Clerk's mind in not desiring to drop the county on account of the negligence of the Agricultural Society, or the oversight of the Governor, in not making an appointment. The Chief Clerk does not feel like taking any responsibility in the matter.

The SECRETARY: That makes a very satisfactory explanation, and it brings it right up to the Board to say what should be done. If you want to bring up before to the Board what is the standing of the members of your Board, or what is the standing of the last member elected from any county, that is all right, but the Secretary has no authority to decide this matter.

Mr. JOEL A. HERR: Would it not be just as well to leave it blank?

DIRECTOR MARTIN: We think the responsibility of the membership rests with this Board, and not with the clerk—entirely so. He takes the list as he finds it, and if the names are not dropped by authority of the Board, he puts them in.

MR. BLYHOLDER: I move that the Secretary be requested to suspend all these non-active members, and that a committee of three be appointed to go over the matter with him and report at the next meeting.

This motion was properly seconded.

MR. JOEL A. HERR: The question arises in my mind whether, if an agricultural society sends in a name, and the Board elects him a member, you can turn him out before the end of the three years for non-attendance, or only for ill conduct.

The SECRETARY: In answer to Mr. Herr, the Board does not have the power, but the Society that sends him has that power. As I understand it, these names have been allowed to stand here to call the attention of the Board to the fact of how long these places have been vacant.

MR. FENSTERMAKER: Mr. Chairman, it seems to me that this Board should have the power to declare a vacancy where a man does not present himself at the meetings. Why, you might just as well have a lot of posts or inanimate objects. They would do just as much good.

The SECRETARY: It is not that we are opposed to doing it; simply we have not the power. That belongs to the Society that sends them.

MR. BARNES: I agree with Mr. Fenstermaker in this matter. If the Board has the power to seat a member, it should also have the power to declare a vacancy. I know of one county that has never had a representative here in the seven years I have been a member of the Board, and it has a good Agricultural Society. I would suggest that this committee be appointed to confer with these Societies and see what can be done.

The SECRETARY: I think the point in the minds of these gentlemen is that the purpose of these Societies is to recommend these men for membership, and all the Committee on Credentials is to do is to see that their credentials are in proper form. They are simply the evidence that these men have been elected by their Societies at home. We have no power to declare any of these places vacant. We can only call the attention of the Societies to the fact that such men do not attend, and are inactive, but we cannot declare the place vacant.

MR. HOLMAN: I think much of this may be caused by the dilatory secretary of these different Societies, and I think this committee should stir them up and have them elect men who will do their part.

MR. BARNES: In my remarks I referred to some of the cases where they have not elected a member for several years. I know that Cumberland has not elected a member for the last five or six years.

MR. JOEL A. HERR: I take issue with the Secretary on one thing. The Board has control over its own membership. The members are always elected after they are appointed by their Societies. In one instance, at least, they refused to seat a man after he had been appointed by the Society of his county.

The SECRETARY: That was because his credentials were not in proper form.

MR. JOEL A. HERR: No; it was because of the man himself.

MR. W. F. BIDDLE: Are the members seated or elected by the Board?

MR. JOEL A. HERR: Elected.

Mr. BLYHOLDER: For that reason let us have this committee, and if necessary suggest an amendment to this Act, so that the Board may have some authority over its members.

The SECRETARY: I would like to get a whack at my friend right here. I would like to ask him whether, if a man is elected to the General Assembly and gets his credentials, he does not become a member without the General Assembly electing him? It seems to me to be almost an absurd proposition. They may have the power to depose him, but they have no power to elect him.

MR. JOEL A. HERR: There is a possibility that by legal proceedings he could claim his seat, but the Board has the power of its membership, and has the right, in my judgment, to elect a member after he has been appointed by the different Societies, and it has been my experience in the last thirty-five years that we have always elected them.

MR. BLYHOLDER: I want to say that on several occasions I made a motion that they be seated, not elected.

MR. FENSTERMAKER: I remember having made the motion that we admit the members.

MR. BLYHOLDER: Well, what does that mean? What is the difference between tweedle-dum and tweedle-dee?

MR. WELLER: How about the county that does not have a county organization?

The SECRETARY: They are not entitled to a representative according to the Act of Assembly. It is intended to advance the interest of agriculture in the county.

MR. A. P. YOUNG: There seems to be a lack of interest on the part of the Societies, and, sometimes, also on the part of the Committee on Credentials. Take my own case. I came here without credentials. I was elected last January, but I didn't have the certificate with me when I went to the meeting; I forgot to take it with me. When I got back, I mailed it to the Secretary of the Society, expecting him to send it to the Secretary of this Board; yesterday he told me he had neglected to do so because he had neglected to get the signature of the President. Now, I have been elected, or I will be, as soon as my certificate gets here, but I have nothing to show for it, and yet I have been accepted as a member.

The SECRETARY: That is because the Board has full confidence in your statement that you have been elected.

DR. BECK: I think where a man is elected and does not come, it would be well to take up the matter with the Society and tell them that this man is not fulfilling his duty in the proper manner, and then if he is elected again, we can refuse to seat him.

SECRETARY CRITCHFIELD: I would say, in answer to the gentleman from Blair, that in every instance the Secretary has sent a notice to the Society of the expiration of the term of their representative. That is all we can do. We try to keep a correct roster. Mr. Martin has charge of it, and he is always faithful. And that is all we can do.

MR. MESSINGER: I thoroughly agree with Dr. Beck. I think where a man is elected to represent his people, and he does not do it, I don't believe he is any good to this organization, and I think this

gentleman has the correct idea of what to do with him. If a man does not take interest enough in the matter to attend the meetings, he is not entitled to a seat in the Board.

The CHAIRMAN: This matter has been threshed out at considerable length. Are you ready for the question?

The question having been put, the motion was found to have been carried.

The CHAIRMAN: This Committee will be appointed later in the day. We will now proceed to take up the next item on the program, which is "Unfinished Business."

The SECRETARY: The minutes were not read, and the only item of unfinished business that I can recall is the report of this special Committee on Legislation that was appointed at the last meeting, and if my memory serves me correctly, Mr. J. Aldus Herr is chairman of that Committee. This Committee as appointed to inquire into and report on the subject of Agricultural Legislation in Pennsylvania, and take up the question of appropriations with our next Legislature.

MR. WELLER: I don't see why it was necessary to appoint that Committee; we have a regular Committee on Legislation.

MR. TAYLOR: It appears to me that if there are any members of this Committee present they should report.

The SECRETARY: It was not appointed to take the place of the Standing Committee, but to confer with it and to act in conjunction with it. I will read the names of the Committee: Messrs. J. Aldus Herr, W. E. Perham, M. E. Conard, P. S. Fenstermaker and I. A. Eschbach.

MR. FENSTERMAKER: That is a mistake. I am not a member of this Committee. At least, if I am, I have never been informed of it, or notified of any meeting.

MR. GEORGE: I presume that is a mistake in subsituting Mr. Fenstermaker's name for mine. I am a member of that Committee. We met, and Mr. Martin gave us such instructions as he thought fit, but there was nothing definitely done. Mr. Martin said he would call us together again between that time and this meeting, but we have not met since, and I don't know that there is anything special to report.

DIRECTOR MARTIN: With your permission, Mr. Chairman, I would like to say a few words on this subject. There has been quite a lack of unity among the different agricultural organizations, and the best way to secure legislation and appropriations, is to secure co-operation of all the interests in agriculture, and this Committee, as I understand it, was appointed for the purpose of formulating such methods as will meet with the approval of all the interests in agriculture. And if it were proper at this time, I would suggest that since

the larger part of this Committee is not here, but will be, later the Board defer action upon this report until a future session when the delegates can reorganize and receive the report. I have no doubt that the Institute session which follows this meeting will be glad to allow the Board the time to hold a short session to receive the report, and will be glad to co-operate with any legislation that may be suggested. I merely make this suggestion. If the Board deems proper to reorganize during any of the Institute sessions, we shall be glad to give them the time.

MR. GEORGE: I think the name of Mr. Shoemaker was overlooked as a member of that Committee; if I am correct, he was appointed on that Committee because he is a member of the Assembly, and he was instructed to take such notes as came under his notice. Mr. Herr was made President, and Mr. Shoemaker Secretary.

The SECRETARY: I would like to ask if your recollection of the other gentlemen as named is that they are correct?

MR. GEORGE: Yes, sir.

The SECRETARY: This Committee was not appointed immediately following the adoption of the motion, but a slip was handed me giving the names of the gentlemen appointed by the Chair to serve on it. I am not willing to admit I was mistaken, and may be able to locate the slip of paper.

MR. TAYLOR: I move that this Committee be continued since it has not yet made its report.

This motion was properly seconded, and duly carried in the regular way.

MR. WELLER: Why this Committee when there is a regular Legislative Committee? Are they to report only to this body, or to the Legislature? The Legislature does not like to have so many bodies to deal with.

The SECRETARY: The resolution was that a committee of seven be appointed to act with the Department of Agriculture and inquire into the best methods to be used in securing legislation and appropriations to further the cause of agriculture in the State. It is possible that conditions that prevailed at our State Capital last winter had something to do with it. I was very busy at the time, but I am sure you remember that the whole Board of Agriculture was called to Harrisburg to co operate with the Department of Agriculture to secure the appropriations that were secured, and it required some rather strenuous efforts to get what we did. Now, as I understand it, this Legislative Committee is not appointed to devise legislation, but to aid in securing legislation that has been devised.

MR. JOEL A. HERR: Also to devise, if I am correct.

The SECRETARY: I think if you will look the matter up, you will see that it is supposed to assist in procuring legislation that has been already devised.

MR. KAHLER: I have served on that Committee for many years, and it was always so understood. In regard to the remarks of the gentleman from Somerset, Mr. Weller, I would like to say that when this Committee was appointed, there was no desire to interfere with the regular Standing Committee of the Board. It was simply appointed to act in connection with the regular Committee, so that when any questions arise we can act as one man.

MR. JOEL A. HERR: I think the best thing to do is to let this Committee report, and its report will be the report of the Legislative Committee. I make a motion to that effect.

The CHAIRMAN: There is a motion already before the house, that the report of this Committee be accepted, and the Committee continued to make a further report at this session.

MR. GEORGE: I understand that this session is to close in about an hour, and I do not see how we can make a further report. There is no one here.

MR. BLYHOLDER: That is very easily remedied; it is called together by the Vice-President, and I move you, sir, that when we adjourn this morning, we do so to meet at the call of the Vice-President.

MR. RODGERS: I second that motion.

This motion was duly carried in the regular way.

MR. JOEL A. HERR: It occurs to me that in many of the societies of the State, they don't really appreciate what the Board of Agriculture is for. You know the Act of Assembly creating this Board dates away back to 1874-76. Since then the Department of Agriculture has been formed, and some of its duties defined in the Act creating the Board. But I think it would be well to have the Secretary of Agriculture prepare a circular and mail it to each Agricultural Society of the State and then they would understand just what is expected of them. A member of the Board who does not take any interest in Institute work, and does not work for the betterment of agriculture in his county has no right to be considered a member and should not be allowed to remain such.

MR. W. F. BIDDLE: If the Secretaries of the Agricultural Societies throughout the State are like some of those I know, it would do them good.

MR. BLYHOLDER: I know the public is sadly in need of information on this subject, and I have asked my Institute workers to take a few minutes to explain to the audience the duties of the chairman and of the audience, and it comes with a great deal more force from the Institute speaker than from the chairman himself. In my county, a great many people believe that the county chairman is well paid. I believe he is, in information.

MR. JOEL A. HERR: I make my suggestion as a motion, that the Secretary prepare such circular as I have suggested and mail it to each Agricultural Society in the State.

This motion was properly seconded.

The SECRETARY: I suppose the Secretary will have to use a little of his good judgment in the matter, as the Act is very vague on that subject.

MR. BLYHOLDER: I am afraid that perhaps it will entail a lot of extra work on the Secretary, and perhaps also mean a great deal of expense.

The SECRETARY: The expense will not be much outside of some gas light which it will be necessary for the Secretary to consume when he sits up at night doing this work; but if it is the wish of the Board, I am willing to take upon myself the extra work.

MR. SCHULTZ: I think that is a very good idea, because I know members in my county who think the county chairman is well paid; some of them think I would not have taken it if it did not pay me, and I believe that a good many of my fellow members run up against the same thing.

MR. BRONG: I think the Secretary should notify the Society that a member of the Board elected by them who does not take an active part, will be dropped.

MR. JOEL A. HERR: Le me give you a concrete instance of this: You remember a few years age the Board received two sets of credentials from Centre county, one in the name of Col. Reynolds and the other Col. Woodward. There were two Societies in that county, and the older one had elected Col. Woodward. The other, and newer one, had elected Col. Reynolds. Three out of five of the Committee on Credentials decided that Col. Reynolds' credentials were correct; the other two held they were not, so it was decided to carry it over until the next meeting. Correspondence was entered into with Col. Reynolds, and he was informed what he was expected to do. When he learned this, he promptly refused to serve, and Col. Woodward was elected by the same Society. Now, there is a case where a man, when informed of his duties, refused to serve, and many others would no doubt do the same, if they knew before they were elected what was expected of them.

The CHAIRMAN: Are you ready for the question?

The result of the poll showed that this motion was duly carried in the regular way.

MR. TAYLOR: As there is nothing before the house, I wish to make a statement of the condition of the Washington County Agricultural Societies. We have three Agricultural Societies, and, as I understand it, only one receives the one hundred dollar county appro-

priation, and recognition from the State Board. I represent a Society that has been in existence for fifty-seven years, and has held a fair every year. Since that time there have been three others organized which have since died. We have also had two or three others. We have always received the State appropriation. Last year a new organization made application, and we also made application for that hundred dollars in connection with the thousand dollars. Having three Agricultural Societies, our County Commissioners decided to divide the appropriation between Burgettstown, Washington and West Alexandria. We received the State appropriation of one thousand dollars, and are in existence the longest, and so have the right to representation.

The SECRETARY: The Act of Assembly, as I remember it, provides that a county to be eligible to representation on the Board was also to received the appropriation of one hundred dollars. Now the decision of that question does not depend entirely upon the Commissioners. I don't see why the State Board should not have some authority.

MR. TAYLOR: That is what I brought it up for.

The SECRETARY: I am not here to interpret the law. That is the part of the Courts. I am giving you my own view. I think your county is acting wisely, if they have three organizations, to divide the money between them. It might be well also to have the work and the honor of representation divided between them.

MR. DAVIES: There has been a recent decision in regard to the hundred dollar appropriation—that is, it is to go to the organization that has expended the greatest amount for the dissemination of agricultural knowledge. The thousand dollars that is paid to the county is paid in proportion to the amount expended in premiums. The Societies make their report to the Commissioners before the 15th of November, and he makes his report to the State.

MR. BLYHOLDER: For what?

MR. DAVIES: Agricultural experiments.

MR. TAYLOR: That is, the President must make affidavit that there has been expended by the Agricultural Society in one year since the last report, so much on horses, so much on cows, sheep and implements, &c. If it exceeds a thousand dollars, they are entitled to a thousand dollars, but if it only amounts to five hundred dollars, they will only receive five hundred.

MR. MESSINGER: As President of our organization, I would say that we must make an itemized statement—John Smith, bushel of wheat, and so on. Whatever goes out of the county is struck off. We have two other organizations in our county, and they were getting quite an advantage over us, so I went to the Commissioners' office, and asked to look over the list, and found that 40% went out of the county, so we came out right.

The SECRETARY: You gain in premiums?

MR. MESSINGER: Yes, sir; it is always well to look into these things. Some people are always a little bit smarter than others.

The SECRETARY: That is a pretty good trick, but I do not think it is quite in accordance with the Act of Assembly. I think the Act of Assembly provides that the money shall be raised from the treasury of the Society. If you have this money in your treasury, you can go to the Commissioners; I do not think it makes any provisions regarding the premiums going out of the county. Suppose the fellow from the other county has better horses, or better swine or cows than you have; unless he stands a chance of winning a premium, there will be no incentive to him to exhibit them in your county, and you will lose the benefit of what information you could have obtained from the comparison.

MR. MESSINGER: That man gets a first-class premium, but we are only entitled to our money from the Commissioners for premiums paid in the county. We paid out a great deal outside of the county, and in the county we expended over $1,500.

MR. FENSTERMAKER: I think Brother Taylor refers more to the condition of things in his own county than anything else. Now, no county can support three fairs. Why not get together and have one big fair, like the great Allentown Fair?

MR. BLYHOLDER: It is like politics; we cannot get together.

The SECRETARY: You get your appropriation for the Allentown Fair?

MR. FENSTERMAKER: Oh, yes; but we spend over $25,000 in premiums.

MR. TAYLOR: Our county is large. I do not altogether agree with the gentleman in thinking that we could do more good by having one fair for the entire county. It may be all right in his county, but we believe that by having these several fairs in different parts of the county, it brings the stock breeders into competition with each other and stimulates the breeding of better stock and the raising of better corn. The point I wanted to bring out is, whether it is in the province of the Commissioners to say which of the three societies shall have the hundred dollars. We pay premiums out of our treasury, and then we have the county appropriation and the State appropriation to help us.

A Member: I think the gentleman is wrong, because the Act of Assembly provides that the oldest organization in the county shall get the money.

MR. MESSINGER: Now, in the Northampton County Agricultural Society we hold fairs without paying any dividends; whereas, our other fairs are corporations and run for their own profit. We

hold a county fair, and we are entitled to our thousand dollars so long as our institution exists, no matter how many others may spring up.

MR. TAYLOR: In answer to the last speaker: We have a corporate body, and it is one of our organizations. In the other two, they receive their members by subscription, and they get a dividend, if there is any. The Union Agricultural Society of Burgettstown has no profit. If the Secretary and your honorable selves would come to Burgettstown and buy a membership ticket for a dollar, it would admit yourself, your wife and your children under twelve years old. You would have the right to come to our meetings and there vote for the officers. Any money in our treasury is paid out in premiums and our premium list grows every year. There are three paid officers—the Treasurer, Secretary and Assistant Secretary. The other officers have their expenses paid while in the service of the fair. The rest goes for the benefit of the farming community of Washington county. We think we have the ideal way to conduct a fair. No one of the three is a county organization.

DIRECTOR MARTIN: I feel almost tempted to add a little to this discussion myself. I would like to know, for our information, how many persons present represent an agricultural society? Hold up your hands. That is good. It has been a part of my work for the past twelve years to collect information relative to agricultural subjects. I ask certain questions relative to the conduct of these fairs, and report them in bulletin form, as you all know. But what I want to say is this: You gentlemen are in close touch with these Societies, and I want you to go to the officers and find out what special measures have been adopted to emphasize agriculture in reference to expert judges and expert managers—men expert in poultry, in the animal line and in vegetables. Place such men in charge, and then get good judges—good expert men who can stand up and tell the people the reason for the conformation of the body to a certain type, and the desirabilty of it. I take this opportunity to emphasize this point.

MRS. SMITH: Gentlemen, I want to say something on this very subject. I have made a very strong effort to wake up my county on this very subject. We have a very able President, and he is very anxious to give the county expert judges, but even so, it is very often a mistake to give premiums to people who exhibit stock which is not up to standard. I suppose it is done to prevent ill feeling, and possibly to encourage them to exhibit their best, but it has the effect of discouraging the owners of pure bred stock from exhibiting them. So much so is this that last year I went personally to see the owners of pure bred stock, and was met with the reply, "Why should I send my pure-bred Holsteins over there and pay a man three days' time to look after them, when any low scrub gets a premium at the county fair." I say we can establish a standard, but we must send our cattle there, and then we must have expert judges who are not influenced by anything but the quality of the animal itself. We have come to where there is a great deal of talk about the pure-bred animal, and very

little about thorough-bred men and women, and it is time that we begin to take up this part of the question.

MR. KAHLER: I have been identified with county fairs for many years, and if there has been any disposition to favor the scrub cow over the other cattle, I am not aware of it. We try to have expert judges to judge the animals, and we pay more for purebred stock than we do for scrub cattle. We always try to have expert men who are unbiased for our judges.

DR. BECK: No matter what kind of a judge you may have, you will always hear complaints from some people about not getting their just dues. Last year we had a man who paid a thousand dollars and another who paid $15,000 for a prize bull. We had an expert judge, and he put the ribbon on the bull which cost $15,000.

MRS. SMITH: I want to say just one word more. I don't own any cows, so I was not hit very hard. The State Board of Agriculture was very good to us last year. They sent us Dr. Conard, who gave us a nice talk in front of the grand stand, with a nice herd of Holsteins. Then in the Womans' Department we had some nice talks. We have in our county many able women who could stand on a soapbox, if necessary, and talk for ten minutes on schools or household affairs. Last year you sent us Mr. Murray, of Columbia county. He gave us a splendid talk on apples. Right on the table there was an exhibit of apples all covered with the Scale, and the man did not know it. Side by side with it, was another exhibit of finest kind of apples, and the man didn't know it, and they at once became object lessons. It seems to me that this is the way to educate our people up to what they really need to know. I am not at the top of the class in efficiency, but I know it, and I want to learn and pass on my instructions, so that we can wake up the whole county. Then we want a Baby Show, and we want it bad; and there are a great many other things that we want to show people and get them interested.

MR. BLACK: Some years ago we appointed a committee, consisting of breeders of livestock in the different counties, and this committee was to select the names of the judges to be sent to the different fairs of the State. I think, that as the result of this, some of the counties have received considerable information. In our county we had Dr. Carl Gay, who was able to give us the reason for his judging, and I am sure that if our fair associations would take advantage of this, it would prove of great value.

MR. RODGERS: I have been identified for many years with the fair in Juniata county. We have always tried to get the best men possible, but whatever decision they gave, there were always some of them kicking. We changed that, and selected representative men from the State Board of Agriculture. Some of them came from a distance, and some of them from nearby counties, but since then we have not heard any complaints. The men chosen have been represented here, and they have been able to stand up and tell us why they gave the premium to that horse, or that cow, and I think no one has heard a word of complaint in our county since we have been getting our judges from the State Board of Agriculture.

MR. DEWITT: I wish to say that in Tioga county we have followed the same plan that Mr. Rodgers, but we go a little bit further. We put them in a ring, and place a policeman in the ring with them. Then we forbid anybody going into the ring, or around the cattle while the man is judging. If he wants to call attention to any horse, or cow, or sheep, he has the right to call the owner, or the party representing him, and we find that is a practical way to stop all of the kicking against the judging. We have had very little trouble the last five or six years in handling our cattle in that way.

It seems to me that this man from Allentown here made a few remarks reflecting on Tioga county. We have two fairs in Tioga county, but I believe in one good fair for each county, the State appropriation to go to it. With all due respect to the other fair, it is eking out a miserable existence. The buildings have become delapidated, and they can hardly meet the demands of the premiums, and it does look to me that one good fair in each county, and then the people take hold and boost it, would be better for the agriculture of the county.

DIRECTOR MARTIN: This subject has become intensely interesting. There is just one other thought, and that is the amusements at our county fairs. If there is any one here whose fair has made a success or real wholesome, high-toned amusement, I wish the gentleman would get up and tell us how to do it.

MR. DAVIES: Coming from a county where we have four fair associations, I realize, as said here, that one good fair would be better. But there is an incentive in having the four associations; each one simply puts forth every effort to become the best. In our county we have one association that has held its sixty-sixth annual fair. Last year we made up our minds that something must be done to wipe out our indebtedness, otherwise we would be forced out of existence. We had been paying anywhere from two to five hundred dollars for amusements. Last year we took local amusements entirely. We had a basket ball grounds laid out, which we devoted to playing for the championship of the county, and also for a fifty dollar prize. We also had a riding tournament, made up entirely of county men, and all the principal organizations of the county sent representatives there to compete for the prize, which was a silver cup. Everybody said it was the most successful fair we ever had, and one of the most interesting and instructive we had ever held.

Speaking of judges, we have had the same trouble as the others, but this year we expect them from State College, and also have Dr. Gay.

In regard to the Ladies' Department and home work, we have expert judges there; because we find the ladies, as well as the men, take offence, we get them from outside. Our fair is now on the best basis it has ever been from the time I can remember.

DR. BECK: In regard to fair amusements, I believe one of the most successful fairs I have ever seen has never had any form of amusement—not even a horse race. I refer to our neighbors just across the line, at Toronto, who refused to reciprocate or to become annexed.

MR. FENSTERMAKER: There is a danger line in amusements. Now, the great Allentown Fair may just be reaching that line. We spend five thousand dollars for a horse, and three thousand for a man to fly for three days. I believe we spend about ten thousand dollars for amusements in the three days. Some of us have been advocating, in a quiet way, a Judges' Pavilion, where the judge can explain why the animal wins, as it passes by, and I believe in experimental plots, and things of that sort. The time may come when we can have them.

The SECRETARY: I would like to ask the gentleman who speaks so enthusiastically about Toronto: Are the people there so interested in instruction that they will listen to the speakers? We are called upon to furnish speakers—especially Mr. Martin is, but my experience has been that the speaker does not get the attention. Suppose it is due to the speaker, but they seem to prefer amusement to instruction.

MR. DAVIES: There is always a certain element that amusement attracts, but we can have amusements, and we can have instruction. There are always people who are anxious to learn, and we can have both. If the Secretary comes to us I will guarantee him a good and attentive audience.

MRS. SMITH: I have been talking a great deal with the New York people across the line, and the Cornell people have been sending speakers out. One of them says he discovered that it is the man who does something with his hands that can get the attention of the people, whereas the man who uses only his lungs cannot get an audience. I tried last year to talk against a moving crowd on our schools. The women near me could get what I said, but to try to talk against a moving crowd is very trying to the nerves, and I do not think I shall attempt it in the same way again. I think I will try a small megaphone this year.

DIRECTOR MARTIN: We have with us an expert poultry judge; perhaps he can give us some light on this matter of judging. I should like to hear from Mr. Wittman.

MR. WITTMAN: The first thing I should see to is that none of the officers of the fair, and none of the employees would show poultry, and then I would get the best judges from outside, so there would be no local prejudice enter into it. I was very sorry to hear a man talk this morning of having a policeman beside the judge. I would like to hear a man ask why he did not get a prize. His answer might be full of information to him. At our National Convention at Denver we had a fight of almost a day on the subject of judging poultry openly, and I am glad to say we won. Heretofore they have always had closed judging in poultry. If everybody hears what is said, there cannot be any claims of unfairness. Of course, it puts the judge on a high moral plane. He has to be proof against any outside influences. He has to judge a bird on its merits. I don't believe the fair can spend money to a better adventage than to get the very best judges, and that is the only way you can win the best bred animals of your

county. A man who knows more about animals than the judge does, is not going to send his animals there to be judged by a man who knows nothing about them.

MRS. SMITH: I wonder whether the gentleman has any suggestion to make about getting the poultry out of the boxes so that the audience can see them? Also a cow that is to be judged, so that the audience can learn the points of a good dairy cow? Some of us are very anxious to know a better way of judging poultry than just by the notches in their combs. You know most people are breeding mixed breeds, and we want a judge who will get down to better instruction of the people by pointing out the good points of the pure bred stock, and showing wherein the pure-bred is better than the cross-bred. Such a judge could do more things than judge.

The CHAIRMAN: The Chair would state that we have allowed a great deal of latitude in these discussions. In the first place, because there are some new members who may feel a little out of place until the ice is broken. But now the time is approaching when we must adjourn this session. I would like to state that the session this afternoon will be presided over by the member from this county, Mr. Kerrick, who will call to order at 1.30. The first thing on the program will be an address of welcome by the Hon. William Maxwell, Judge of the Bradford County Court; he will be followed by Benj. Kuykendall, Esq., President of the Bradford County Agricultural Society, and by G. E. Frost, Esq., the Burgess of Towanda. The response to these addresses of welcome is expected to be made by Hon. John K. Tener, Governor of Pennsylvania. I suppose he will be on hand, although I have not yet heard of his arrival here. After this we will be addressed by the Hon. Edward M. Bigelow, State Highway Commissioner, on "Facts about Road Construction: the New Law."

DIRECTOR MARTIN: The Governor has made a very strong personal effort to be here, but owing to the meeting of the Supreme Court and several other important meetings which take place this week, he may be unable to be here. In case he does not come, we have with us the Secretary of Agriculture who will take his place, after which the meeting will be open for any remarks the members wish to make.

MR. BLYHOLDER: In reference to the several important meetings in Harrisburg this week, the one most important to us is the one on Friday, in reference to agriculture education. I should be sorry to see this meeting go by without any recognition, and I think our Board should be represented, because I think the question of agriculture in our rural schools is one of the most important that can be brought up.

DIRECTOR MARTIN: May I be permitted an inquiry? I understand that invitations have been sent out, and I would like to ask the Secretary whether an invitation has come to us?

The SECRETARY: None has come to me for the Board, or for the Department, but I have received one personally, and when the

proper time comes, I shall ask to be excused so as to get there. Still I see no reason why we should not show our interest in the question by sending one or two of our members there. The representation need not be very large.

DIRECTOR MARTIN: I fully realize the importance of the meeting, and yet we feel loath to see our members go because of their interest in their own work.

MR. FENSTERMAKER: I see no reason why we should not send a good representation. It is a very important meeting, and a very important question. Our Superintendent of Public Instruction has held it back for ten years. He says we are not prepared for it. The whole truth is, that he is not prepared for it. We should have had it twenty-five years ago, and I think it entirely fitting that some one should be sent there to prod him up.

MR. KESTER: For a number of years I have gone over the State and tried to arouse interest in agricultural education. I have talked personally with the State Superintendent, and I think the last time I talked with him I saw a change of heart, and I think we should bring the matter to his attention. I might say that I think of asking the Chairman to get away in time to be there.

MR. BLYHOLDER: I have also received an invitation from both parties, but I have in mind a representation from the Board.

The SECRETARY: I would like to have an expression of the sentiments of the members of the Board. I think Mr. Martin is jealous of his work, and anxious to keep his people here, and I am glad to see this interest in his business, but if the members do desire, I think a small representation can be arranged without materially affecting Mr. Martin's part of the work.

DIRECTOR MARTIN: Personally, I would say, I realize the importance of the meeting, and I have had an invitation to be present and expressed my regrets that that meeting and our State meeting would take place at the same time, but I simply wish to remind you that the State Board has received no invitation.

PROF. MENGES: The Secretary has already said that he shall ask permission to leave here and attend the meeting. Why could not the Secretary represent this Board and deliver the message that this Board wishes to send that Organization? I simply make this as a suggestion. I cannot make it as a motion, as I am not a member of the Board.

MR. FENSTERMAKER: Harrisburg is on the way home of many of us, and I think it would be well for as many of us as possible to go there. I think the Secretary will agree that two or three men may lose the last half day's session in order to attend that meeting.

DIRECTOR MARTIN: But I don't want to ask them to lose last half day's session.

MR. FENSTERMAKER: But that meeting is much more important than the last half days' session. I would like Mr. Blyholder and two or three others who go that way to stop off and represent us.

MR. A. P. YOUNG: Who is responsible for this meeting?

The SECRETARY: My invitation comes from the State Grange, but is not signed by it. The Governor is interested: I do not know who is the authority, but I am under the impression that the State Grange is responsible.

MR. W. F. BIDDLE: I move you that our worthy Secretary be made to represent our Board at that meeting.

MR. FENSTERMAKER: Would it be well also to include Mr. Kester and Mr. Blyholder?

DR. BECK: I make that amendment.

The SECRETARY: If it is to be a Committee to represent the Board, let us be sure that these gentlemen are members of the Board. Is Mr. Blyholder a member of the Board?

MR. BLYHOLDER: Yes, sir.

The SECRETARY: How about Mr. Kester?

MR. KESTER: I am not.

The CHAIRMAN: Then it will have to be the Secretary and Mr. Blyholder.

The CHAIRMAN: Are you ready for the question?

The question having been put and a vote taken, the motion was found to have been carried in the regular way.

MR. JOEL A. HERR: I move we adjourn.

This motion having been properly seconded and duly carried in the regular way, the session adjourned to meet again at the call of the Vice-President.

N. B. CRITCHFIELD
Secretary.

LIST OF COUNTY INSTITUTE MANAGERS FOR THE SEASON OF 1911-12

County	Name and Address of Chairman
Adams,	A. I. Weidner, Arendtsville.
Allegheny,	A. J. Purdy, Imperial, R. D.
Armstrong,	S. S. Blyholder, Kelly Station.
Beaver,	A. L. McKibben, New Sheffield.
Bedford,	W. F. Biddle, Everett, R. D. No. 2.
Berks,	H. G. McGowan, Geigers Mills.
Blair,	W. F. Beck, No. 1927 W. Chestnut St., Altoona.
Bradford,	F. D. Kerrick, Towanda, R. D. No. 9.
Bucks,	Watson T. Davis, Ivyland.
Butler,	W. H. Milliron, Euclid.
Cambria,	James Westrick, Patton.
Cameron,	F. X. Blumle, Emporium.
Carbon,	Edw. Lienhard, Mauch Chunk, R. D.
Center,	John A. Woodward, Howard.
Chester,	M. E. Conard, Westgrove.
Clarion,	J. H. Wilson, Clarion.
Clearfield,	Peter Gearhart, Clearfield.
Clinton,	Joel A. Herr, Millhall, R. D.
Columbia,	A. P. Young, Millville.
Crawford,	J. S. Patton, Hartstown.
Cumberland,	T. J. Ferguson, Mechanicsburg.
Dauphin,	E. S. Keiper, Middletown.
Delaware,	E. J. Durnall, Swarthmore.
Elk,	John G. Schmidt, St. Marys.
Erie,	Archie Billings, Edinboro.
Fulton,	J. L. Patterson, McConnellsburg.
Fayette,	T. H. Smith, Dunbar, R. D. No. 32.
Forest,	C. A. Randall, Tionesta.
Franklin,	J. P. Young, Marion.
Greene,	J. W. Stewart, Jefferson.
Huntingdon,	G. G. Hutchison, Warriors Mark.
Indiana,	S. C. George, West Lebanon.
Jefferson,	Peter B. Cowan, Brookville, R. D. No. 4.
Juniata,	Matthew Rodgers, Mexico.
Lackawanna,	Horace Seamans, Factoryville.
Lancaster,	J. Aldus Herr, Lancaster, R. D. No. 4. E. K. Hibshman, Ephrata.
Lawrence,	Sylvester Shaffer, New Castle, R. D.
Lebanon,	Edw. Shuey, Lickdale.
Lehigh,	P. S. Fenstermaker, Allentown.
Luzerne,	J. E. Hildebrant, Dallas, R. D. No. 2.
Lycoming,	A. J. Kahler, Hughesville.
McKean,	O. W. Abbey, Turtle Point.

County	Name and Address of Chairman
Mercer,	Wm. C. Black, Mercer.
Mifflin,	M. M. Naginey, Milroy.
Monroe,	F. S. Brong, Saylorsburg.
Montgomery,	J. H. Schultz, Norristown.
Montour,	J. Miles Derr, Milton, R. D. No. 1.
Northampton,	O. S. Messinger, Tatamy.
Northumberland,	L. A. Eschbach, Milton, R. D. No. 1.
Philadelphia,	Samuel K. Foster, Torresdale.
Perry,	A. T. Holman, Millerstown.
Pike,	B. F. Killam, Paupack.
Potter,	A. T. Crittenden, Oswayo.
Schuylkill,	John Shoener, New Ringgold.
Snyder,	J. S. Kauffman, Middleburg.
Somerset,	J. C. Weller, Rockwood, Pa., R. D. No. 2
Sullivan,	E. R. Warburton, Campbellville.
Susquehanna,	F. A. Davies, Montrose.
Tioga,	C. H. DeWitt, Mansfield.
Union,	J. Newton Glover, Vicksburg.
Venango,	W. A. Crawford, Cooperstown.
Warren,	Geo. A. Woodside, Sugargrove.
Washington,	D. S. Taylor, Burgettstown, R. D. No. 3
Wayne,	W. E. Perham, Pleasant Mt.
Westmoreland,	M. P. Shoemaker, Greensburg.
Wyoming,	D. A. Knuppenburg, Lake Carey.
York,	G. F. Barnes, Rossville.

LIST OF INSTITUTE LECTURERS FOR SEASON OF 1911-12

Anderson, H. M., New Park, Pa.
Arny, L. W., New Britain, Pa.
Baker, D. B., Dillsburg, Pa.
Baker, Prof. Hugh P., State College, Pa.
Barnitz, Chas. M., Riverside, Pa.
Bond, M. S., Danville, Pa.
Bonsteel, F. E., Bear Lake, Pa.
Burnite, Miss Mary A., No. 509 W. 121st St., New York City
Campbell, J. T., Hartstown, Pa.
Card, Fred W., Sylvania, Pa.
Carter, Miss Arabella, No. 1305 Arch St., Philadelphia, Pa
Clark, M. N., Claridge, Pa.
Cochel, Prof. W. A., State College, Pa.
Conard, Dr. M. E., West Grove, Pa.
Cook, Walter A., State College, Pa.
Cooke, Prof. Wells W., Department of Agriculture, Washington, D. C.
Cornman, Chas. T., Carlisle, Pa.
Detrich, Dr. J. D., No. 438 Adams Avenue, Scranton, Pa.
Dorsett, E. B., Mansfield, Pa.
Drake, W. M. C., Volant, Pa.
Eschbach, I. A., Milton, Pa., R. D. No. 1.
Fassett, F. H., Meshoppen, Pa.
Foulke, Miss Jean Kane, West Chester, Pa.
Fulton, Prof. H. R., State College, Pa.
Frear, Dr. Wm., State College, Pa.
Funk, Dr. J. H., Boyertown, Pa.
Funk, Sheldon W., Boyertown, Pa.
Gardner, Prof. Frank D., State College, Pa.
Gooderham, H. M., Patton, Pa.
Goodling, C. L., State College, Pa.
Herr, Joel A., Millhall, Pa., R. D.
Hibshman, E. K., Ephrata, Pa.
Hull, Geo. E., Transfer, Pa., R. D.
Jackson, Prof. Homer W., State College, Pa.
Johnston, J. B., New Wilmington, Pa.
Kahler, A. J., Hughesville, Pa.
Kester, R. P., Grampian, Pa.
Kline, Frank, Spring City, Pa.
Lighty, L. W., East Berlin, Pa.
Mairs, Prof. T. I., State College, Pa.
McCallum, M. H., Wernersville, Pa.
McCurdy, C. C., Hartstown, Pa.
McDowell, M. S., State College, Pa.

McIntire, W. H., State College, Pa.
Menges, Prof. Franklin, York, Pa.
Mitchell, R. V., State College, Pa.
Monroe, Mrs. Geo. E., Dryden, N. Y.
Murray, D. E., Catawissa, Pa.
Myers, C. E., State College, Pa.
Noll, Chas. F., State College, Pa.
Northup, H. W., Dalton, Pa., R. D.
Owens, Prof. Wm. G., Lewisburg, Pa.
Patton, W. M., Mosgrove, Pa.
Peachey, J. H., Belleville, Pa.
Philips, T. J., Atglen, Pa.
Phillips, E. L., New Bethlehem, Pa.
Phillipy, Dr. W. T., Carlisle, Pa.
Rich, Chas. H., Woolrich, Pa.
Ross, Warren G., State College, Pa.
Severson, B. O., State College, Pa.
Seeds, Robt. S., Birmingham, Pa.
Shaw, Prof. Chas. F., State College, Pa.
Stout, W. H., Pinegrove, Pa.
Thomas, Miss Sara P., Philadelphia, Pa.
Van Noy, Leon Otice, Troy, Pa. No. 66.
Watts, D. H., Kerrmoor, Pa.
Weld, R. J., Sugargrove, Pa.
Wittman, W. Theo., Allentown, Pa.
Woodman, S. Paul, Rushland, Pa.
Zeigler, Mrs. Sarah B. F., Duncannon, Pa.

MEETING OF THE FARMERS' ANNUAL NORMAL INSTITUTE

PROGRAM

First Session Convenes Tuesday Afternoon, May 21, 1912.

MR. F. D. KERRICK, Towanda, Pa., Chairman.

Call to order 1.30.

Addresses of Welcome, by Hon. Wm. Maxwell, Judge, Bradford County Court, Towanda, Pa.

Benj. Kuykendall, Esq., President, Bradford County Agricultural Society, Towanda, Pa.

G. E. Frost, Esq., Burgess, Towanda, Pa.

Response, by Hon. John K. Tener, Governor of Pennsylvania, Harrisburg, Pa.

1. "FACTS ABOUT ROAD CONSTRUCTION: THE NEW LAW."
Hon. Edward M. Bigelow, State Highway Commissioner, Harrisburg, Pa.

Tuesday Evening, May 21, 1912.

MR. C. H. DEW'TT, Mansfield, Pa., Chairman.

Call to order 7.30.

1. "ORGANIZATION FOR SOIL EFFICIENCY."
Dr. Thomas F. Hunt, Dean, Experiment Station, State College, Pa.

2. "THE FARMER AND THE CHESTNUT BLIGHT."
Prof. Samuel B. Detwiler, Executive Officer, Chestnut Blight Commission, Philadelphia, Pa.

Wednesday Morning, May 22, 1912.

MR. D. A. KNUPPENBURG, Lake Carey, Pa., Chairman.

Call to order 9.30.

1. "CARE AND MANAGEMENT OF THE ORCHARD."
F. H. Fassett, Meshoppen, Pa.

2. "FEEDING AND MANAGEMENT OF DAIRY COWS."
Prof. H. E. Van Norman, State College, Pa.

Wednesday Afternoon, May 22, 1912.

MR. F. A. DAVIES, Montrose, Pa., Chairman.

Call to order 1.30.

1. "LIVESTOCK SANITATION."
Dr. C. J. Marshall, State Veterinarian, Harrisburg, Pa.

2. "HORSE BREEDING AND MANAGEMENT."
Dr. Carl W. Gay, Director Horse Breeding, University of Pennsylvania, Philadelphia, Pa

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Wednesday Evening, May 22, 1912.

MRS. JEAN KANE FOULKE, West Chester, Pa., President.

Call to order 7.30.

1. "HOME HYGIENE."
Miss Mary A. Burnite, No. 509 West 121st St., New York City.

2. "RURAL UPLIFT."
Mrs. E. E. Powers, Pennsdale, Pa.

3. "HYGIENE AND SANITATION IN THE PUBLIC SCHOOLS."
Dr. A. L. Russell, Midway, Pa.

Thursday Morning, May —, 1912.

MR. A. T. CRITTENDEN, Oswayo, Pa., Chairman.

Call to order 9.30.

1. "IMPORTANCE OF FIELD WORKERS FOR THE DEVELOPMENT OF BETTER METHODS IN AGRICULTURE."
   Dr. J. D. Detrich, Chatham, N. Y.
   L. W. Lighty, East Berlin, Pa.

2. "USE OF DYNAMITE IN FARM OPERATIONS."
   (Illustrated.)
   Willard Young, Wilmington, Del.

Note:—Demonstrations by actual practice will be made on a nearby farm.

Thursday Afternoon, May 23, 1912.

HON. A. L. MARTIN, Director, Harrisburg, Pa., Chairman.

Call to order 1.30.

1 "REPORT OF COMMITTEE ON CO-OPERATION."
   Messrs. R. P. Kester, Grampian, Pa.
   E. P. Dorsett, Mansfield, Pa.
   Archie Billings, Edinboro, Pa.

2. "CO-OPERATION OF FARMERS."
   Prof. Franklin Menges, York, Pa.

3. THIS PERIOD WILL BE DEVOTED TO THE IMPROVEMENT OF INSTITUTE WORK.

Note:—The session is open for discussion to all County Chairmen of Institutes and Lecturers, and it is expected that each member will come prepared to offer a suggestion looking to the devolopment of the work. Five minutes' time is allotted to each member.

Thursday Evening, May 23, 1912.

MR. W. A. CRAWFORD, Cooperstown, Pa., Chairman.

Call to order 7.30.

1 "SOME LESSONS IN NATURAL HISTORY."
   (Illustrated with lantern slides.)
   W. H. Stout, Pinegrove, Pa.

2 "MODERN METHODS OF FINISHING AND DRESSING POULTRY."
   (Illustrated with lantern slides.)
   Prof. R. V. Mitchell, State College, Pa.

3. "FARM BUILDINGS OF CONCRETE."
   (Illustrated with lantern slides.)
   E. S. Fowler, Chicago, Ill.

PROCEEDINGS OF THE FARMERS' ANNUAL NORMAL INSTITUTE, HELD IN THE COURT HOUSE, TOWANDA, PA., MAY 21-24, 1912.

Towanda, Pa., May 21, 1912, 1.30 P. M.

Mr. Kerrick in the Chair.

The CHAIRMAN: The meeting will please come to order. The Secretary will please call the roll.

This and subsequent roll-calls showed the following members present:

COUNTY INSTITUTE MANAGERS

A. I. Weidner,	Adams county.
A. J. Purdy,	Allegheny county.
S. S. Blyholder,	Bedford county.
W. F. Biddle,	Blair county.
W. F. Beck,	Bradford county.
F. D. Kerrick,	Bucks county.
Watson T. Davis,	Armstrong county.
James Westrick,	Cambria county.
Edw. Leinhard,	Carbon county.
M. E. Conard,	Chester county.
J. H. Wilson,	Clarion county.
Joel A. Herr,	Clinton county.
A. P. Young,	Columbia county.
J. S. Patton,	Crawford county.
T. J. Ferguson,	Cumberland county.
E. S. Keiper,	Dauphin county.
John G. Schmidt,	Elk county.
Archie Billings,	Erie county.
J. L. Patterson,	Fulton county.
J. W. Stewart,	Greene county.
S. C. George,	Indiana county.
Peter B. Cowan,	Jefferson county.
Matthew Rodgers,	Juniata county.
Horace Seamans,	Lackawanna county.
J. Aldus Herr,	Lancaster county.
E. K. Hibshman,	Lancaster county.
Sylvester Shaffer,	Lawrence county.
Edward Shuey,	Lebanon county.
P. S. Fenstermaker,	Lehigh county.
J. E. Hildebrant,	Luzerne county.
A. J. Kahler,	Lycoming county.
W. C. Black,	Mercer county.
M. M. Naginey,	Mifflin county.
F. S. Brong,	Monroe county.
J. H. Schultz,	Montgomery county.

C. S. Messinger, ...Northampton county.
I. A. Eschbach, ...Northumberland county.
Samuel K. Foster, ...Philadelphia county.
A. T. Holman, ...Perry county.
B. F. Killam, ...Pike county.
J. C. Weller, ...Somerset county.
E. R. Warburton, ...Sullivan county.
F. A. Davies, ...Susquehanna county.
C. H. DeWitt, ...Tioga county.
J. Newton Glover, ...Union county.
W. A. Crawford, ...Venango county.
George A. Woodside, ...Warren county.
D. S. Taylor, ...Washington county.
W. E. Perham, ...Wayne county.
D. A. Knuppenberg, ...Wyoming county.
G. F. Barnes, ...York county.

INSTITUTE LECTURERS

H. M. Anderson, Chas. M. Barnitz, M. S. Bond, F. E. Bonsteel, Miss Mary A. Burnite, J. T. Campbell, Fred W. Card, Mrs. Arabella Carter, M. N. Clark, Prof. W. A. Cochel, Dr. M. E. Conard, Chas. T. Cornman, Dr J. D. Detrich, E. B. Dorsett, W. M. C. Drake, I. A. Eschbach, F. H. Fassett, Mrs. Jean Kane Foulke, Sheldon Funk, H. M. Gooderham, Joel A. Herr, E. K. Hibshman, Geo. E. Hull, A. J. Kahler, R. P. Kester, Frank Kline, T. I. Mairs, M. H. McCallum, C. C. McCurdy, M. S. McDowell, Prof. Franklin Menges, R. V. Mitchell, Mrs. Geo. E. Monroe, H. W. Northup, J. H. Peachey, T. J. Philips, E. L. Phillips, Charles H. Rich, Robt. S. Seeds, W. H. Stout, Miss Sara Thomas, Leon Otice Van Noy, D. H. Watts, W. Theo. Wittman, S. Paul Woodman, Mrs. Sarah B. F. Ziegler.

The CHAIRMAN: Has the Deputy Secretary any reports to make?

The DEPUTY SECRETARY: Yes, sir: I wish to say that I have here a letter from the Governor, in which he writes to express his sincere regrets at not being able to be here owing to several important meetings which are held at Harrisburg this week. Also a letter from General Beaver, expressing his regret that his health will not permit him to be present with us at this meeting.

The CHAIRMAN: Ladies and Gentlemen: It affords me great pleasure to see your faces this afternoon, and to meet the members of the State Board of Agriculture of this great State of Pennsylvania. After all the hardships of the winter, the good Lord has provided us with sunshine and pure air this afternoon, and I appreciate very much meeting you here. We hope that while you are in our old county of Bradford, we may be able to make it pleasant for you during your stay with us. I know what the organization has done for the agricultural people. You can go around over the State, and wherever you find farmers gathered together, you will find them discussing how to better the conditions of the soil, or how much lime to use on it, or how much

fertilizer it is best to use. This organization has brought all this about, and I appreciate very much myself what the efforts of this organization has done.

Without any further remarks, I take great pleasure, ladies and gentlemen, in introducing to you the Hon. Judge Maxwell, who will make the address of welcome.

Judge Maxwell spoke as follows:

ADDRESS OF WELCOME

By HON. WM. MAXWELL, Towanda, Pa.

Mr. Chairman, and Members of the State Farmers' Normal Institute, Ladies and Gentlemen: On behalf of the people of Towanda and of the County of Bradford, we extend to you a most cordial welcome to the county seat of Bradford county.

We realize that many of you, undoubtedly, have come a considerable distance to Towanda with this Institute when other places might have been more acceptable, and where your entertainment might have been better than we can give you—possibly places where they might have had more local attractions to show you than we are able to furnish you at this place; but I assure you that no place could have been selected by you where you could be more welcome, where the people would be more glad and feel more glad, than we are, by the selection of this place to hold this Institute, and therefore we give you a most cordial welcome. It is seldom that we have the opportunity to extend the hospitalities of our town to such a distinguished gathering as we have at this time, and we appreciate the fact that you gentlemen have gone to considerable trouble to come here in order that we might, drink at the fountain of knowledge and be benefitted by your coming here to teach us a better agriculture.

After you have stayed with us during your sessions, mixed with our people and have seen some of our farms that we are able to show you, and after you have seen the interest our people are taking, and the progress they are making, especially our farmers, in and along agricultural lines, you will agree that while we are not living in the most populous community of this Commonwealth, our farmers are alive to the spirit of the times. You will see that our farmers who live on these hillsides and in these valley, are not only good citizens, but are a progressive lot of people, living in good country homes. They have their stock in good, sanitary buildings, and they feed them along scientific principles, and I suppose that accounts, in a measure, for the good butter that Bradford county has the reputation of making. As you know, it stands well in the market and commands the highest price.

We are living today in what might be called an age of whirlwind. Things are not done as they were years ago. The old canal boat with its mules has given way to the steam and electric roads. The aeroplane has come to stay and furnish business for the undertaker. The more danger, the better, I think, our people like it. The automobile has become a necessity, and is fast displacing the horse. In fact, these improvements are going on at a terrific rate.

It is the same in matters of State and political matters. We are now voting in some states for direct Presidential elections. We will soon be voting directly for United States' Senators. In some states the ladies are already voting, and they have shown their good judgment in matters of State. And I have no doubt that in agriculture the improvements have been just as great. The same strides have been made. The old sickle and grain cradle have been succeeded by the reaper and binder; the scythe and sneath by the mowing machine; the old-fashioned plow by the sulky plow, and that in its turn by dynamite. And the Lord only knows what next; I suppose it will be the millenium. Agriculture has kept up with the spirit of the times in the matter of improved machinery and the education of the people.

Now, I have but one suggestion to make, and it is this; and I think it is the solution of the abandoned farm. We have some of them in this county. It has been a matter of regret to see our farms abandoned, and it has been a rather difficult problem to determine just what was the cause.

In the first place—and this is largely true of a small class of farmers—they are educated along the line of their business. They wander along through the Street of Haphazard, and trust to the elements to do the rest for them; they go ahead and farm along the lines of their father and grandfather. The result has been that they fall by the wayside. They become discouraged, and every man they come in contact with is discouraged by the result of their failure. They bring up their boys to believe that farming does not pay, and teach them to go into other business.

Another class have the idea that the farmer is not quite well dressed enough. Very silly. They have an idea that because the farmer has a little dirt on his shoes, or he does not dress quite so fashionably as some other people, he is not respected, and they bring up their children to believe that they must go to some of the more populous sections and dress well, in order to be respected. That is one reason for the abandoned farm.

Another reason for the abandoned farm, is that our people of the East could not compete with the farmers of the West. The railroads would bring the stuff in from the West and lay it at our doors at a less price than the people of the East could produce for.

Now, my idea of farming is to make it profitable, in the first place. The pendulum has been swinging away from the farm for years, but it is now beginning to swing the other way again. Men of education are giving their whole time to farming, and they have made a pleasure of it because they were educated to farm in an intelligent and profitable way.

Now, take a young man who wants to follow the legal profession. He must have a good common school education, at least; then he must submit to an examination by a State Board of Examiners to determine whether he is entitled to study law or not. If they report favorably, he can begin to study. If he is under twenty-one, he must study three years; if over twenty-one, two years, and then undergo another examination to see whether he is qualified to practice. You take the surgeon and the physician. After a common school education, they have to go along the same lines. Then after they have studied for three or four years, they have to undergo another examination to see whether they are fit to practice the profession. You take a minister, or a civil or mechanical engineer, and you will find the same thing. Take any other line except that of farming, and you will find that a man has to go through a period of training in order to qualify to do his work, and if it is necessary for these classes, it is much more necessary for the farmer. It is much more important to him than his geography or the history of the country. It will do him more good to know the principles of farming, than to know the cause of the rise and fall of the Roman Empire. What we want to do is to give people an education in and along the lines of work they are to follow. If you understand the soil and its principles and elements, you understand every principle of agriculture, and what will be the result? Where we are now growing poor fruit and very little of it, we will be growing good fruit and more of it on the same trees. Where one blade of grass is growing, two would grow. The result would be that farming would become profitable, and if one man makes a success of it, his neighbors will take it up. You never see a man make a success of a thing that you don't see two other fellows ready to follow. So it is with farming.

If a man cannot afford to educate his boys in the line of work in which they are to engage, let the State do it. I don't believe there is a farmer in Bradford county, or in the State of Pennsylvania, who cannot afford to buy the necessary education for his boys. Let him smoke fewer cigars or drink less intoxicating liquor, and he can spend his evenings in educating himself. If the State of Pennsylvania can afford $50,000,000 for the improvement of the public roads of the Commonwealth, let them take one fiftieth of that amount and furnish a public library to the Commonwealth. I would take the young men and boys who are to engage in farming, and educate them along this line, and what would be the result? They would make money in farming, and if one man can make it, another can. They simply do not understand it. I believe in book farming myself. I believe that the better education you can give a young man starting out on the farm, the larger will be the proportion of profits in the business which he undertakes. The result will be that you will make him a better man, a better citizen, and you will have solved the high cost of living as I think it would be better to do it.

Now, gentlemen, this, to my mind, is the solution of the abandoned farm, and you, gentlemen, are in a position to bring it about. There is no reason why we cannot teach every young man the desirability of

following farming. If his father cannot afford to educate him, the State can afford to do it. That is my solution of the abandoned farm. I want to say to you that a man cannot farm without an adequate education along the line of his work, any more than he can practice law, or cure you of disease, or follow any other profession. It is simply ridiculous when we stop to think of it. And it has been the history of the past that men who make failures of everything else can go out on the farm. But then when he reaches the noon day of his life, he discovers that he has made a mistake—made a failure of this, too, simply because he didn't understand it.

"They told me the way I took was hard;
That many a time my weary feet would bleed;
They said at last I'd find my way way barred;
I would not heed.

"They bade me turn and go the other way;
'This way,' they said, 'with thorns and thistles strewn';
But I was young; ambition led the way.
I thought I knew.

"But when my bleeding feet came to the end,
And I bound and scourged by cruel fate,
'Alas!,' I cried, 'please let me start again.
But it was too late."

Now, gentlemen, in conclusion, I want to again assure you of your cordial welcome to the City of Towanda. We will turn over to you the keys of the town, the jail and the lockup, and this will assure you of a safe return to your homes. That you may have a successful Institute, and return in safety to your homes, is, gentlemen, the sentiment of this community.

The CHAIRMAN: At our Board meeting this morning, we had up the county fair for discussion. I see the President of our Agricultural Society is here, and I take pleasure in introducing to you Mr. Kuykendall, who will address you.

Mr. Kuykendall addressed the meeting as follows:

ADDRESS OF WELCOME

By BENJ. KUYKENDALL, ESQ.

Mr. Chairman, Members of the State Board of Agriculture, State Lecturers, Ladies and Gentlemen: It hardly seems necessary for me to say a single thing, since this Court of Agriculture has been duly and legally opened by the Judge thereof, and I believe that I am not

living up to the duty entrusted to me by the local people if I remain here for any length of time, when I should be on the streets to welcome those who are coming in on the afternoon train. I have already met the most of those gathered here, and so far as possible, I have extended to them the hearty greeting of my hand.

After the first news of the battle of Manila, the people were eagerly awaiting the returns. Upon the streets of New York, thousands upon thousands of people were gathered to read the news as thrown upon a screen in front of one of the large newspapers of the city. Suddenly there appeared on the screen the news that Wilkes-Barre had gone Republican. Immediately came from some one in the throng "Where is Wilkes-Barre?", and at once back came the reply from some patriotic citizen in the crowd, "Seventy-nine miles south of Towanda." And so you see, my friends, this great metropolis of Towanda is the point from whence distance is computed.

My friends, you have come to a section of country where the red blood of Connecticut still flows in our veins; you have come to a section where the latch-string always hangs out and where the work of the Department of Agriculture has taken root and sprung up; and for that reason, the people of Bradford county and of this little Borough of Towanda give you a most cordial welcome. We have given to the State Board of Agriculture one of its most conservative members, and for this reason, also we welcome you; and when you leave us to return again to your homes, we want you to feel that you have been among friends; that it has been good to have been with us, and that your meeting has been a profitable one. Again, I welcome you.

The CHAIRMAN: We have with us the Mayor of the town. I will now introduce to you Mr. Frost, who will also speak to us.

Mr. Frost spoke as follows:

ADDRESS OF WELCOME

By G. E. FROST, ESQ., Towanda, Pa.

Mr. Chairman, and Members of the Farmers' Normal Institute: I wish to say, in the first place, that the speech-making is not in my line. This is the first time I have ever had occasion to appear before an audience of this kind. I know it is customary when gatherings of this kind come to the city, to welcome them. Just what it is for, I don't know—whether we need any more jails, or whether we need add any extra policemen to our force, I don't know, but I don't think we need do it for you gentlemen.

I don't think I can add anything to the welcome you have received from my predecessors, Judge Maxwell and Mr. Kuykendall; but I assure you that we are pleased to have you with us today, and I, as the chief executive of this far-famed city, wish to extend to you a most hearty welcome.

The CHAIRMAN: We have on the program a response by the Governor. In his absence I will take the liberty of calling upon our worthy Secretary, the Hon. N. B. Critchfield.

Secretary Critchfield responded to these addresses of welcome as follows:

ADDRESS OF SECRETARY CRITCHFIELD

Mr. Chairman, Judge Maxwell, Mr. Kuykendall, Mr. Frost, Ladies and Gentlemen: I was in Union county a few years ago attending a Farmers' Institute. At one of the evening sessions the Congressman of the district was expected to speak "to the young people" and the young people sat there quietly waiting for him to put in an appearance, but he didn't come, and the manager came to me and said, "You will have to address them." The meeting was in a country church and the house was full to overflowing. Well, I got up into the pulpit, and held on to the table to keep myself from trembling. It is not easy to fill the place of some one else from whom a great deal is expected, and I did not hope to succeed in holding the attention of that audience half as well as the Congressman would have done. I saw in the audience before me a good old Baptist minister, eighty-four years old, and I said to him, "My brother, will you tell me how old a man must be before he is relieved from what is called 'stage fright'," and he answered, "You must ask some one older than I am."

I was gratified to listen to these excellent speeches; there was not a "Frosty" one among them. There is always something in the faces of the people who bid us welcome that talks to our hearts even more distinctly than words do, and there are cases when we would just as soon that they did not welcome us, as to have them do so. Such however, is not the case here; we feel that we are among friends.

Last evening coming up on the train, the conversation was all about the beautiful scenery, and then when we came to Towanda and saw the beautiful town, and met the cordial welcome, we felt that our lines had fallen to us in pleasant places.

We are glad to be here because we are farmers and Towanda is an agricultural town, surrounded by a most beautiful agricultural section of our country.

At some places to which we go they take us into great iron mills and other large manufactories but the interest we feel in them is naturally small, compared with the interest we have in the fact that you people of Bradford county have about 3% of the 240,000 farms of the State. You have between seven and eight thousand farms in Bradford county. So we feel that we are right among our own people.

And then we are glad to be here for another reason. We have come into a county that has a history—a county that had an im-

portant part in making some of the most important history of this great country of which we are all a part. Among the names of those who have done great things stand out that of David Wilmot. I can remember just as well as though it were yesterday, of my father reading about David Wilmot and what he was doing in Congress. Some of you may remember that after the close of the Mexican War, President Polk sent a message to Congress asking for an appropriation of $2,000,000, to pay for the lands that were ceded to the United States as the result of the war. That was the great cause of the war, the annexation of Texas—and by the way, there comes to my mind just now a little story, which I'm going to tell you. During the Presidential campaign of 1844, when the main issue was the annexation of Texas to the United States, I was a little boy, but I went with my father to a political meeting and I heard A. J. Ogle make a speech. He said, "I have just come from Berks county; they are all Democrats there," (He was a Whig). "In going over the county I stopped at a barn where some men were threshing and asked one of the men how they were going to vote"; he said, "I don't know yet; the man who tells us how to vote didn't come around yet, but I guess Polk and Texas are both good men."

But to return to my subject; David Wilmot got up in Congress when the final vote upon the appropriation was about to be taken and offered the following amendment: "Provided that neither slavery nor involuntary servitude shall exist in any part of said territory except for crime whereof the party shall first be duly convicted."

I remember my father reading that when I was a small boy, and I say I am glad to be with you here because you sent men to represent you in the councils of the nation who have helped to make this country great. There is no man in this country who wears a Grand Army button who does not revere the name of David Wilmot. I went out to the Riverside Cemetery this morning, when taking my morning walk, and looked up the grave of David Wilmot and stood for a while, head uncovered, by its side.

As I look into the faces of these Bradford county people I am impressed with the thought that we want to leave some good with you and we want also to receive some good from you to take away with us, so that we shall feel better in consequence of our coming to your city.

Reference has already been made to the fact that some of your ancestors were from New England and that you have Connecticut blood in your veins, which certainly counts for a great deal, and probably accounts for the progressive Yankee tendency we find in this county. And then too, you have blood from France, from Germany and from England, the best nations of the earth; so why should you not be a good people, and why should we not enjoy this week that is to be spent with you.

And now, Mr. Chairman, if you will bear with me a moment, I will just say a word as to who *we* are. If we may say so without appearing egotistic, we consider ourselves a pretty good kind of people also. We come here to perform a helpful service as educators. The judge has given us a most excellent educational address. He has told us of the necessity of educating the farmer. He has told us of the course of study that must be taken by the lawyer, and he can talk from experience when speaking of the study of law, he has told us of the edu-

cational training needed by the physician which of course is apparent to all; but what must a lawyer know in comparison with a farmer? He does not need to know the law, if he knows how to get at the knowledge he needs for each individual case he has to try, when the case comes to him. He must know where and how to find it. What has the physician to do but to keep one being, or animal if I may so speak, going a little longer in the way nature has determined that it should go? But what has the farmer to do? If his animals do not suit him, he must go to work and breed others that will be more satisfactory; if his poultry does not suit his taste he must go to work and improve the breed. Why, only yesterday on my way up here, I read of a proposition to breed hens that will lay red eggs. I should like to see the lawyer, or the doctor, who has a proposition on his hands like that! Why, the farmer to be well equipped for his business must be the best educated man of all. We who are here in this work are not all college-bred men. I see before me some men who are among our most successful Institute workers, who have never been inside the walls of a college as students. They have got their education right out upon the farm.

I remember that about fifteen years ago I was assisting Mr. Piollet, whom I see sitting before me, in holding his farmers' institutes in this county, and one very cold morning we drove about fifteen miles through unusually severe weather. There was a little academy building where the institute was held. I can't recall the name of the town, but I remember the academy. We were nearly frozen when we arrived at the place and we went into a little hotel to get warm. The entire house was cold with the exception of one room, which had a large stove in it. There were several people crowded around the stove and as we came in and were trying to get warm, one young fellow said to another, not knowing as I supposed who we were, "Jim, are you going to stay for the Institute?" "No," replied the other. "What would I want to stay for? Why, those fellows that are coming here are college fellows, and I'll bet they don't know anything about farming. I see that one fellow is going to talk about plowing and I'll bet anything that he never plowed a furrow in his life."

At that point I said, "My good man, I guess you mean me, for it is I that intends to talk upon the subject of plowing." "Well," said he, "Did you ever plow?" And I answered, "I got about half my growth between plow handles." This statement was true then; it isn't true now because I have grown quite a good deal horizontally since that time; it might still be true, if the measure were taken lengthwise, or up and down. "Well" he said, "If you really mean that you have plowed some yourself I shall go to hear you." And so he came into the Institute. When it came my turn, I took up the subject and talked about the manner in which the horses should be hitched to the plow in order that both horses and plowman might perform their work with as much ease and comfort to themselves as possible. I spoke of the manner of adjusting the plow to regulate the furrow-slice and to throw a flat furrow or to stand it at an angle. The method of regulating the depth of the furrow and everything else connected with plowing received proper consideration, and after I got through, the young fellow came to me and said, "Well, I believe now that you have done some plowing and I am glad that I came to the meeting."

My own experience in this matter has been the experience of a great many of us. My friend here, from Lycoming county, Mr. Hughes, and my friend from Lackawanna county, Mr. Northup, and my friend from Clinton county, Mr. Herr, and most of the members of the State Board of Agriculture that are here, got their education just as I did. These are the men who can talk from experience, as well as give to us the theory of this great industry.

Now I have not told you this in order to brag of our work. We did not come here for that purpose. We are somewhat like the Irish girl who, when she went to confession, was telling the Priest her shortcomings and bemoaning her sins and said, "Did you know, Holy Father, that I am engaged to be married?" "Why, no, Mary, said the Priest, "who is the lucky man?" She answered, "Patrick Dolan; and he was over to see me last night, and stayed until after midnight." The Priest said, "That's too long, Mary." "And," she said, "he kissed me." The Priest, willing to have a little fun at her expense, said, "Didn't he kiss you more than once, Mary?" And, quick as a flash, she answered, "I came here to confess, Holy Father, and not to boast." That is our position. We came here to do what we can in the way of helping you along the lines in which you as farmers are interested and not to boast.

The CHAIRMAN: I am going to call on the Hon. A. L. Martin to address us.

Mr. Martin responded as follows:

ADDRESS OF MR. MARTIN

We have been thrice welcomed this afternoon, in these addresses of welcome. The Honorable Judge of the Courts of this county has addressed us in a manner that must, of necessity, give us an uplift in our calling. The President of one of the agricultural societies of the State, and of this county, has welcomed us in an address which arouses enthusiasm on the part of the citizens of this great Commonwealth, who are here represented today; and the chief officer of the town has also welcomed us with a very high tribute. Previous to the selection of this place to hold the meeting, I felt assured that we should meet with a very warm welcome from the people of Bradford county, because for more than twelve years I have mingled with the farmers of this county, and I can think of no one instance in all these years where the Institutes were not fully sustained by the farmers of the county. It is one of the most pleasant parts of my official work when I go over the counties of the State and consider the moral support they have given the Farmers' Institute, hence I am confident that every representative here today is proud and grateful for the privilege of coming to Bradford county to hold this Institute.

And now, my friend, we are proud for another reason to come here, because we are coming to a county which stands among the first in one of the greatest interests along the lines of agriculture—the dairy interest of the State. If Bradford county does not rank first, it is a close second, and I think she is first. I know she stands first in the production of good butter. I do not have the figures of the number

of pounds that are produced in this county to supply the United States' Navy. Will some of the gentlemen freshen my memory on that subject?

Why shouldn't the people of Bradford county be proud of their community? I wouldn't give much for people who are not proud of the community in which they live.

Some things have been said here in reference to the political history of Bradford county, that will bear investigation and reflect credit upon the county. It has been my privilege for a number of years to be associated with the members from Bradford county, and they have been an incentive to the interests of agriculture. The worthy Secretary said he was a small boy, but I want you to understand that he was not a small boy in his efforts for agriculture.

During the sessions of this Institute I expect to be called upon to do my part in anything that will contribute to the best interests of this Institute.

I see in the audience a number of gentlemen from whom we shall be glad to hear a word, and I will yield up this time in order to give them an opportunity to speak to us.

The CHAIRMAN: I see in the audience before me a product of our county, Dr. Marshall, from whom we shall be glad to hear a few words.

DR. MARSHALL: I don't know whether to extend a welcome to the visitors, or extend my hand to be welcomed. Bradford county used to be my home, and I like to come back here both as a visitor and a farmer.

I listened to the address of the Judge, and I heartily agree with him in every way. What agriculture needs is education—especially a common school education. I am glad to be here and help the good work along. Whether as a visitor, or as one of your native citizens, I am glad to be here.

The CHAIRMAN: Has any other member anything to say?

MR. KESTER: I have always noticed that the address of welcome and the response is always more or less perfunctory in its nature, but I have felt that the addresses this afternoon were unusually sincere. I would like to have your expression when we leave. We are always very voluble in our expressions of welcome. In fact, I think we are all somewhat like the old lady who was somewhat thrifty, and yet wished to be hospitable; she said, "I like to have people come and visit and take a meal; and I don't mind their staying for two meals; it makes a nice visit; but when they come to stay two or three, or four days, I call that a visitation." I don't know whether our visit will be called a visit or a visitation.

In my work in your county I have always noticed that you are a thrifty people. I think that is because of your New England ancestors. It is a good trait in these days of high cost of living. An old German couple were about to celebrate their silver wedding, and they did not care to have duplicates in their presents, so they had

printed at the bottom of the invitation that a jeweller would have a tent on the lawn, where presents could be bought. They had arranged with him that he should have only one article of a kind, and they were to receive ten per cent. of the sales. So it is in some sections of the State; they are not only thrifty, with the old time thrift, but they want a commission also.

I have had the pleasure of being associated in my work with two of the representative citizens of Bradford county, Prof. Card and Mr. Van Noy, men of whom any county can be proud. Down in the southeastern part of the State where the Pennsylvania Dutch hold sway, Van Noy and I spent the winter; we were regaled with the old-fashioned German cooking, and at one place we had five kinds of pie at one meal, and if Van Noy were here, I'd say he sampled them all.

The Judge called attention to the great profession of law, by which and under which we must all live, whether we practice it as a profession or not; but I want to call your attention to the fact that the farmer also works according to law, and a law that cannot be evaded or overcome—the law of Nature, which is greater than any civil law.

The CHAIRMAN: Are there any other remarks?

Repeated calls came for Prof. Menges.

PROF. MENGES: I was asleep.

The SECRETARY: That comes from eating onions.

PROF. MENGES: I was not at your table, Mr. Secretary. I have nothing to say, so perhaps I ought to sit down, but the Secretary gave me an idea about not wanting to be welcomed. I think some fellows would be very glad, indeed, if they were not welcome. I wrote two letters to this place, and I did not get a very satisfactory reply, so I was not sure whether I would be welcome even if I came here. It was a Dutch gang, this gentleman here (Fenstermaker) and myself who came to the hotel, and were met by a very nice-looking gentlemen who shook hands with us very pleasantly, but when I told him I wanted a room by myself, he said he didn't know whether I could be accommodated. However, I held on, and after a while he came and led me to a very nice kind of a place, where I have a room all to myself. So you see it sometimes pays to be disgruntled and make yourself unwelcome.

The SECRETARY: That is the Dutch of it.

PROF. MENGES: Yes, and that is the good part of it. I don't know as much history as the Secretary, but he was once a school superintendent, and he had to know it. I come from a county where they eat pie, and I eat pie.

MR. HOLMAN: You look it.

PROF. MENGES: You don't come from very far away from it yourself. And when the Bradford county fellows are down there, they are worse for pie than we are; we are satisfied with one or two

kinds, but these fellows want five or six kinds and then they are not satisfied with one good sample, they want to sample each kind over again.

Now, gentlemen, to be serious, I am glad to be here, and let us make this Normal Institute felt more than it has ever been in the State of Pennsylvania. Institute work is the most important work that can be done in Pennsylvania today. Whatever you may say about the lecturer, the work is the greatest that is being done in Pennsylvania today. It brings the college and the university right down to the farm. It brings hope and help to the man who lives away out there, away from associations such as a man should have; it lifts him up to a higher plane and shows him what is being done in this nation. There are mighty things being done in agriculture today—more than in any other vocation in life. And why do I say so? Go to the United States Congress, and every Congressman who looks a little bit into the future and has his eyes open, is trying to get a bill passed to serve the farmer. Among the most recent bills, is one appropriating $600,000 to employ an expert to go out among the farmers and show them how to do things. Ten thousand of that will come to Pennsylvania, if the bill goes through, and it will go through, and Mr. Taft will sign it, because he is a candidate for re-election.

The SECRETARY: He wants to sign it.

PROF.MENGES: Yes, I think he does, and I should not say that. Now, if a law was passed to send out a lot of expert lawyers, or doctors, or preachers, or anything else, you would have no trouble in finding them; but how about agriculture—the most important of them all? Where will you find them? You could wipe off every other vocation on the face of the earth, and we could get along, but how about the farmer? That is pretty plain talking, and I don't know whether you will like it, but it is true. The farmers are not asking for it, but it is coming. If there is one farmer in the audience who has written a letter to the Congressman of his district on the subject, I wish he would raise his hand.

The SECRETARY: I have written a letter to every Congressman in the State of Pennsylvania. The State Board asked me to do it.

PROF. MENGES: That is the reason you did it.

The SECRETARY: And I want to say right here that I got an answer from every Congressman in the State, saying he would be glad to vote for it.

PROF. MENGES: That is what they should do. Now, I ask it again: Has any one else written a letter? There is another one back there.

Do you know that all the corn raised in the United States today can be raised in Illinois, Indiana, Iowa, Kansas, Nebraska and Missouri? Every bushel can be raised in the corn belt. Do you know that every bushel of wheat raised in the United States today can be raised in the wheat belt of the North-west, without overtaxing the fertility of our soil? And do you know that all the potatoes raised

in the United States today can be raised in the State of Maine, and they would have to raise only two hundred bushels to the acre? There is something to be done; and there is another reason why these things are coming. There are thousands of people in the United States today who are going hungry in this land of plenty, where there are possibilities of producing enough to feed the world. In a land like that, people are going hungry; and you tell me that the man who is teaching farmers to do better things, the farmers who are the producers, you tell me he is not an important fellow?

Another thing: There are fellows standing in the way of this advancement. Those of you who read the "Farm and Fireside"—I don't know how many do, but I could recommend you to read several articles that were published on the co-operative societies of the West by E. G. Dunn, Manager of the Co-operative Association of Wisconsin or Michigan—I forget which—but the articles were headed, "How they Whipped Us." It goes on through the difficulties they had to overcome, and tells how finally they got through to Chicago, where they were held up, and that is where they are held up today, by the big terminal elevators. When you ship a carload of wheat from Kansas, Nebraska, the Dakotas, or any part of the Northwest, it has to go through the terminal elevators at St. Louis, or Chicago; sometimes it gets as far as Buffalo and there it is mixed with dirty wheat that comes from the West, and then it is sold as good wheat. A man in the West cannot ship a single carload without going through the terminal elevator, and that is the reason that Patton can raise wheat to $1.15 when he wants to; he buys it at eighty or ninety cents, holds it at Chicago, and the unloads it on you for $1.15. Who pays the bill? The fellow who has nothing to pay with. The Western men beg us to come to their rescue, and we would have nothing to do but to order the carload of wheat shipped direct to New York via the Mississippi River, so that it need not pass through these terminal elevators.

I didn't think I was going to make an address; and I simply want to show you what powerful forces are arrayed against the farmer.

I want to say to you, Mr. Chairman, that I am glad to be in Towanda, and will go home to the Dutch feeling that you people up here know how to entertain just as well as we do down there.

The CHAIRMAN: The program calls for an address by the Hon. Edward M. Bigelow. I am informed he will not be here until Thursday, and I am at a loss to know what to do, but we have with us today a gentlemen whom we are always glad to see—the Agriculturist of the Lehigh Valley Railroad, Mr. F. R. Stevens, of Geneva, N. Y., and I shall now call on him to address us.

Mr. Stevens spoke as follows:

ADDRESS OF MR. STEVENS

Mr. Chairman, and Members of the Farmers' Normal Institute: I want to add a few words of welcome to those already spoken this afternoon. I am glad to see this State Board of Agriculture in this section of Pennsylvania because it is a very good section for agricul-

ture, in the success of which we, as a whole, are very much interested.

The upbuilding of agriculture along the line of this road has been my work, and there we have a common ground. It was a pleasure to me to meet the people at Institutes, and it was a pleasure to have so many of you gentlemen with us, and an honor to me to be allowed to contribute my part to the work in which we are all engaged. I feel very much as your Secretary of Agriculture did. In his address he described the situation exactly when he told about being called upon to take the place of a man who did not put in an appearance, or he would not have been on the program, and as he did, I feel like holding on to the table to keep myself from trembling.

I want to say some things straight from the shoulder, and I want to say them without having a definite address in mind. I want to say to you, because we are working together for the upbuilding of agriculture, we need other methods. Here in Bradford county, a territory with which I am familiar, we have wonderful possibilities. Some men are taking advantage of these possibilities. If you will go a little ways up here you will find what our friends are doing in the growing of fruit. I have been over these farms—some of them. I find that their apple trees and peach trees produce fruit, as much to the acre, of equally good quality with the prize land of the apple belt of Western New York, and yet the land in the Western New York apple belt is sold at from $200 to $250 an acre, and you can buy land in this section of the same kind at from $20 to $30 an acre. I find in this section alfalfa lands that have been made to produce four and five tons to the acre, that could be placed beside any other alfalfa land in this or any other section. I find land back over the hills, ten or twelve miles from here, land that is largely A1 potato land—land that in Maine would bring $150 per acre, and yet here it is selling cheap. I find here dairy herds, similar to the best we find anywhere else, 50% of which are kept on the land, and we find people here who insist that dairy herds do not pay. Friends, we are in a prosperous agricultural section, and yet you will agree with me that these things are true.

Now, then, the work of draining these lands so that they will produce a hundred and twenty-five bushels of corn to the acre; that it will produce three hundred bushels of potatoes to the acre; that it will produce five tons of alfalfa to the acre, as has been done within ten miles of Towanda the past year. The selection of our dairy herds so that each cow will show a profit; the tilling of the land so that it will produce a profit of a thousand dollars an acre, instead of thirty dollars an acre—to show these men how to do this, is your work and my work, but how to do this is what we must discuss. If I am to be permitted a moment, I want to emphasize some things.

We have too many agencies for work, and these do not co-ordinate. To be explicit, we have our State College doing extension work. I am not referring now to the work being done within its walls, but to the extension work. They are doing this work well. The State Department of Horticulture is giving instructions in the growing of orchards, and it is doing well. The Farmers' Institute Bureau is conducting a series of Institutes up and down the State that are first-class in every respect, and that work of extension is being done very well. The railroads have also taken up the work, and they are doing the best they can to aid the State in its work. The great work that

lies before us is to unite these forces, so as not to work at cross-purposes; so as to avoid spending money uselessly, because we have none to spend in that way. The time has come when these things should be taken up—when we should work as a unit in the State. At least this is my judgment. It seems to me that co-operation should begin at home. It seems to me that in agricultural extension this co-operation should be first considered.

In addition to what I have said, let me add: The State College is not being supported as it should be. It should be the work of this body, in my judgment, to take hold of this fact, and work to secure additional appropriations for the building up of our college, for it is the institution from which most of our agricultural education is received. The State should be called upon to appropriate money sufficient to support these schools, as is being done in New York State.

One other thing: This body of men and the corporation I represent here this afternoon should work together, and so far as I am concerned, I want to say that we are willing to do all in our power to bring about a relation between the producer and the consumer which will do away with the conditions that Brother Menges mentioned this afternoon, and we want to do away with every possible obstruction that stands between the producer and the consumer, except the factors that are absolutely essential.

My friends, I came up here to speak directly of some things I have had on my mind for some time, and I feel better since they are off my mind.

I want to make a further suggestion: That the Board of Agriculture appoint a committee to confer with us and see if some of these things cannot be brought about. I would like to have some member of the Board formulate it in his mind, and then put it in the form of a motion. I am not a member of the Board, so simply make it as a suggestion that some member make a motion that such a committee be appointed with authority to represent this body, to confer with other agricultural bodies, and we will do all in our power to bring about these conditions.

The SECRETARY: If Mr. Stevens will just wait a minute, I want to ask him a few questions. I have been thinking of some of these things for some time, and I have thought that possibly this would be a good move: That the State Board of Agriculture appoint a committee to confer with the State Horticultural Association, State Dairy Union, Livestock Breeders' Association, State Poultry Association, Beekeepers' Association, and any other agricultural association and they devise some plan of co-operation. And my thought has been that when we appear before our State Legislature as a committee from the allied agricultural interests, it will make an impression that cannot be secured in any other way. You have asked for suggestions, and that is the line along which I have been thinking. How does it strike you?

MR. STEVENS: That expresses it, Mr. Secretary. I am very glad you have taken it up. I have felt very deeply along this line for some time, and I think it is time we should do more than talk about it. The State is not over-liberal in its appropriations to agriculture—is not over-liberal toward the College, and it is necessary that we should

unite all forces working toward the same end and see if we cannot get better results.

The SECRETARY: And they should do the work together?

MR. STEVENS: And we should all work together. If I am to be permitted, may I ask if any one else has any suggestion along this line?

DIRECTOR MARTIN: I would simply say that the suggestion as outlined by our Secretary has been considered in my own mind for some time, and as the State Board has arranged for an extra session in connection with the Normal Institute, I see no reason why this committee should not be appointed at that meeting, and we can also appoint a Committee of the Institute workers to work in conjunction with it. If there is no objection, I will say that a way will be made for the State Board to hold its extra session on Thursday morning.

The CHAIRMAN: Thursday will be a pretty busy day. Could not this meeting be held on Friday?

The SECRETARY: The Secretary will not be here on Friday; how would Wednesday afternoon do?

DIRECTOR MARTIN: It will be pretty busy, but I think it can easily be arranged for Thursday morning as well as any other time.

MR. HOLMAN: I would like to ask Mr. Stevens a question. You have explained the nature of your work; now tell us how you do it.

MR. STEVENS: My work I can explain in very few words. It is the development of farming all along the line of the Lehigh Valley Railroad. The prosperity of the railroad is dependent upon the prosperity of the people living along its lines. My work is to help the farmer along his individual lines—in the development of his pet schemes—to help him individually. Individuality is all that counts most in every man.

MR. HOLMAN: Does the man come to you, or do you go to the man?

MR. STEVENS: Not altogether that way. I go to the Institute meetings, and the Grange meetings, and so on, and a man who has any difficulties writes them on a slip of paper and hands them to me, or he drops me a card, and then I take my auto—the railroad provides me with one—and go out to his farm, and we sit on the fence and talk it over.

DIRECTOR MARTIN: I wish to call your attention to the program for Wednesday morning: Mr. D. A. Knuppenburg will be the Chairman, and there will be an address on "The Care and Management of the Orchard" by Mr. F. H. Fassett, who has made a great success of his own orchard. This will be followed by an important talk by Prof. Van Norman on the "Feeding and Management of Dairy

Cows." This last number should be particularly interesting to the people of Bradford county, where the dairy interest is such a large one.

MR. JOEL A. HERR: Mr. Chairman, this has been sort of an experience meeting, and we all know that experience is the most valuable thing a man can have. The kernel of it is that a man must love the business he is engaged in, and that love must draw us into a deeper interest in the work in which we are engaged. In travelling over the country I look out of the car window and see fine buildings, and good silos, and evidences of thrift and I say to myself, "That man has been to some school and is putting his theories into practice" He heard something about feeding, and began to put it into practice; then he gets another cow or two and finds his theories work out; then he begins to build his silo. This man loves his work, and takes an interest in it, and it leads him right along to prosperity. After he gets his silo in shape and his herd producing, he is lead on to study the fertilizer question so as to get his soil in good condition. Then he adds more stock, and everywhere we see the result of the work of the schools of agriculture.

Now, I suggest that our institute workers take up this question, and talk of the possibilities of developing an interest in agriculture. A man who does not love his occupation—and I don't care what it is had better get out of it. Get the boys of the farm interested in some special line, and once a boy becomes interested, he will learn to like it and go forward and study it, and learn all he can about it, and by and by he will develop into a prosperous and successful man. I have seen a great deal of that in going over the country. If you see a silo, the next thing you will see a good alfalfa growth, because it is a cheap feed, and a good one, and an easy one to grow. If we can get our institute people interested in these things, then we will have successful institutes. It afforded me a great deal of pleasure to know that during the last season the people would crowd around the speaker and ask him questions. I noticed that especially in connection with Dr. Detrich in Clinton county.

PROF. MENGES: May I say just one word? I have talked enough this afternoon, but I want to make a suggestion. This kind of work was inaugurated a little over a year ago at a meeting held by the Institute workers at State College. We recognized the fact that we must have more money. We recognized the fact that we cannot afford to have any conflicts in our work. We also recognized the fact that if there is any conflict, the fellows who appropriate the money soon find it out.

Then there is another thing: There are none of the County Chairmen with whom I came in contact last year, of whom I did not request that he appoint or select a number of men in his county to meet the State Legislature at Harrisburg whenever the Secretary or the Deputy Secretary shall ask for them to come there, in in order to carry through the appropriations that we have been talking about this afternoon. Now I know very well that when a set of men like we are, assembled here this afternoon, tell the Appropriations Committee what they need, there is no trouble in getting it. We must know first what we want, and I think we should know it so definitely that there is no chance of having it miscarry in any shape or form.

MR. KESTER: We must be prepared to answer any question that may be raised. And not only that; when this bill referred to by Prof. Menges becomes a law, it is a question whether our Legislature will not have the idea that this work is to supersede the work of the four agencies already in the field. Now in order to overcome this idea, we will have to do away with the multiplicities of the work as it now is, and appear before that body as a united force to impress upon them the work that still remains to be done even if this Federal Bill passes and becomes a law. If this $10,000 is duplicated it will eliminate to some extent some of the extension work, but it will by no means cover the whole field, and it is necessary for us to be able to show these facts to the Legislature.

PROF. MENGES: It will not become effective until 1914, I believe.

MR. STEVENS: But all these agencies should be united and worked toward one end.

DIRECTOR MARTIN: They can work along this one line in perfect harmony.

A Member: I will not detain you; I simply want to call your attention to a plant that I have brought with me; you will find it on the stage, and I shall be glad to have you look at it after the close of the session. It is known as the Bulgarian or Sweet Clover, and should be more extensively known than it is.

MR. SEAMANS: At the meeting this morning a motion was made and carried that a committee of three be appointed to act with the Secretary in reference to the credentials of members of the Board. I wish to announce that I have appointed on this Committee, Messrs. S. S. Blyholder, Matthew Rodgers and P. S. Fenstermaker.

I will also announce that there will be a meeting of the State Board of Agriculture at this place tomorrow at nine o'clock.

The CHAIRMAN: Anything further? If not, it is time to adjourn. Mr. DeWitt will preside this evening, and the program is as follows: "Organization for Soil Efficiency," by Dr. Thomas F. Hunt, of State College, and "The Farmer and the Chestnut Blight" by Prof. Samuel Detwiler, of Philadelphia, who is at the head of the Chestnut Blight Commission.

We will now stand adjourned, until 7.30 this evening.

Towanda, Pa., Tuesday May 21, 1912, 7.30 P. M.

Mr. C. H. DeWitt in the Chair.

The CHAIRMAN: The Institute will come to order. I received a notice about two weeks ago from our Deputy Secretary that he wished me to preside this evening. Now, my friends, I have but little experience in presiding at any meeting, but I will do the best I can. I wish to say, before we start this meeting, that this is the second Institute of the kind I have ever attended. I wish to say that I have been very much pleased so far today. There have been some good things brought out, in my judgment, and I have been pleased with the hospitality of the town. While I belong to a county adjoining, and feel very proud of my county, and of my county-seat, I was privileged this evening to be taken around this village in a carriage, and I wish to say to you that I was very much impressed with the town, and with the handsome residence buildings in this place. I didn't know that Towanda was so nice a place as it is. I say this without any boast on my part. I think we have a nice county-seat in Wellsboro, but I must say you certainly have a beautiful place, and I do not wonder that you people with whom I have become acquainted, like to live here.

The first subject on the program this evening is a lecture by Dr. Thomas F. Hunt, Dean of the Experiment Station, State College, on "Organization for Soil Fertility." Dr. Hunt will now speak to us.

Dr. Hunt spoke as follows:

ORGANIZATION FOR SOIL FERTILITY

By DR. THOMAS F. HUNT, State College, Pa.

Mr. Chairman, Ladies and Gentlemen: Since I agreed to write this paper on Soil Fertility, something happened to me. Had it happened to me before I promised to write this paper, I fear I should not have presented it. As a matter of fact, since this thing happened to me, I have been almost ashamed to look a farmer in the face. Now, what happened to me was this: I took a vacation of thirty days, and during those thirty days I drove practically every day, barring Sunday, in a horse and buggy through the State of Pennsylvania. I was brought up in a one-room schoolhouse out in Northern Illinois, and I learned about the Andes, and the Rocky Mountains, the Himalayas and the Appalachian Range, and they all looked alike to me, and I have never gotten out of my mind that childish presentation of the Appalachian Chain; I have never fully gotten out of my mind the childish imagination, that I know a great many people outside of Pennsylvania have, that a great deal of Pennsylvania consists of large mountain ranges running across the State. So I started out to drive from State College to Morrison's Cove. Now, to my childish imagination, Morrison's Cove was a little bit of a narrow place, through which we could

drive in a very short time. As a matter of fact, I spent three days driving through Morrison's Cove. It was not a little bit of narrow cove, but a big farming valley. I drove from Bradford to York county, and then on. Instead of mountains I found valleys filled with beautiful farm lands, and I never before have seen such good farm lands; never before have I seen such uniformly good farm homes. In all that thirty days' drive I saw but two places that made my heart ache because people lived there. And now do you know why I am ashamed to look a farmer in the face? Because I wrote bulletins teaching these people how to farm, and from the looks of things, they were practising all the things I wrote before I was born—and some one told me that was the reason they were good farmers.

A great deal is heard in these days about methods of selling farm products. Co-operation and credit are being widely discussed in their application to farming.

The United States Department of Agriculture has announced that for every thirteen dollars a consumer pays for farm products, six dollars is received by the farmer.

A year ago, I brought to your attention the fact that at Freiburg, Germany, the farmer could come to town by train with his produce, a distance of ten miles, for less than the price he could obtain for three pears. Recently, some time was spent among the farmers of York county. For a distance of ten miles from the City of York, a town of about 45,000 inhabitants, the farmers attend market. They work on their farms five days in the week, and on the sixth day they go to town to sell their produce. There is a saying among them that if a man attends market he always has some money: that if he does not he never has any. This section of Pennsylvania is quite hilly, the land is only moderately fertile, but the improvements upon these farms are uniformly good. It is a community of prosperous, home loving, God fearing people. A very important element in their prosperity is the fact that the farmer secures the last cent that the consumer pays. He does not divide his profits with the broker, the commission man, the wholesale and retail merchant.

York county is typical of many other communities. The importance of the illustration lies in the fact that it is now new. The practice is generations old in the United States, and centuries old in other counties. There are, however, many communities where the practice does not obtain which could well adopt this simple method of bringing the producer and consumer together. The method simply consists of being a farmer five days in the week and a merchant on the sixth day. The results of the sixth day should contribute to a peace of mind on the seventh.

The question of selling has an indirect bearing upon organization for the purpose of maintaining the fertility of the soil. When corn is worth thirty cents, wheat sixty cents, and oats twenty cents a bushel and hay five dollars a ton, the increase from use of commercial fertilizers will not sell for enough to pay for them. If, however, corn is worth fifty cents, wheat eighty cents, oats thirty-two cents, and hay ten dollars a ton, the thirty years' experiments of The Pennsylvania Station indicate that profitable returns may be obtained from the use of commercial fertilizers, if they are purchased at ruling prices. If, however, twenty dollars is paid for a fertilizer whose ingredients

should have been purchased at ten dollars, these same experiments indicate that at prices last named no profit would be obtained.

The Pennsylvania Experiment Station recently received a letter from a citizen of Pennsylvania that he was being offered a fertilizer at $21.00 per ton which was said to be a high-grade fertilizer worth $30.00. The Experiment Station had recently purchased its supply of fertilizers from a local dealer. The ingredients in the ton of fertilizer above mentioned cost the Station $9.50.

It is true, of course, that the Experiment Station had purchased in larger quantities than the average farmer needs and had by competitive bids received, doubtless, a wholesale price. The fact remains, however, that if the Experiment Station had been compelled to pay the price for its ingredients that was asked in the above mentioned $21.00 per ton fertilizer, there would be no profit in using the fertilizer, there would be no profit in using the fertilizer at the prices of farm products above mentioned. At this Station, the value of the increase in the products at prices mentioned has been about twice the cost of the fertilizers applied. Double the price of fertilizers and all profit disappears.

It is evident, therefore, that an essential element in the maintenance of soil fertility in Pennsylvania is to so organize the distribution and sale of commercial fertilizers as to enable the farmer to secure them at a price which will make their use profitable. These statements are not intended and do not in any way reflect upon the legitimacy or business integrity of any of the agencies now engaged in the distribution and sale of these goods.

Although it may see a digression, I desire here to call attention to the sale and distribution of lime in this State. The men who have been studying the condition of the soils throughout Pennsylvania express the conviction that a considerable portion of the area is in need of liming. Generally speaking, those portions which need lime most are farthest removed from deposits of limestone. The cost of transporting lime becomes in these localities a serious question. The transportation agencies have been approached with regard to a low freight rate. Their reply is that they would be willing to consider a low freight rate on raw ground limestone, provided that the State would pass such laws as would guarantee that the purchaser was getting a satisfactory article. They say that their only object in giving a low freight rate would be to cause the farmer to raise better crops. If they furnished the farmer ground material that was not calcium or magnesium carbonate, then their object would be defeated.

They are not willing to give a low rate on burned lime because the privilege would be abused by those wishing to use lime for building purposes. I am bringing this subject to the attention of the Farmers' Normal Institute believing that it is a matter of importance, and one upon which this organization might wish to express an opinion.

In any country, land that has once been fertile can be brought back to a productive condition profitably when the price of the products raised bears a certain relation to the cost of plant food. This condition now obtains in Pennsylvania. According to the thirty-year results of your Experiment Station, it appears that it is possible to maintain the fertility of the soil without diminution for any number of generations as long as the price of farm products and fertilizers

remains at the average level of the last fifteen years. It should be stated that these experiments have been conducted on a naturally well drained limestone soil. This soil, therefore, has what some soils lack in Pennsylvania, namely, good drainage and a fairly abundant supply of lime. Similar fertilizer experiments have been conducted at the Ohio Station, on a soil that lacks good natural drainage and is deficient in lime. The results of the Ohio Station show that when these defects are remedied that such soils respond in like manner to the use of fertilizers. The Pennsylvania experiments were made upon the Hagerstown series of soils, which are typical of the limestone valleys of Pennsylvania; while the Ohio Experiments were made upon the Volusia series which covers most of the northern third of Pennsylvania, southern third of New York State, and portion of eastern northern Ohio.

If there is anyone lesson that the results of these two stations enforce, it is that in order to maintain the fertility of the soil profitably it is necessary to organize some system of farming. It is necessary to till, to tile, to lime, to manure and to fertilize with reference to the crops and with reference to the succession of crops.

These experiments do not show how much yard manure, phosphoric acid or potash may profitably be applied to a particular crop, such as corn, oats or wheat, but they do furnish some indication of what applications of yard manure, phosphoric acid and potash should be applied during one rotation, so that at the close of the rotation the land will be as productive as when the rotation began.

Another and very important lesson of the Pennsylvania experiments is that on land that is well drained and contains plenty of lime, it is possible by the addition of low-priced mineral fertilizers—phosphoric acid and potash—to keep the soil supplied with nitrogen by growing clover once in four years. It seems well established that it is possible to so organize a farming system that it will not be necessary to buy any nitrogen in commercial fertilizers in order to indefinitely maintain the fertility of the soil. It does not follow from this statement, however, that it may not be profitable to do so. On farms carrying a limited number of livestock, the use of nitrogen with phosphoric acid and potash for the production of timothy may be very desirable.

The farmer has three principal sources of nitrogen, viz., clover and other legumes, the liquid portion of the manure and commercial fertilizers. Nothing is plainer than that the farmer should so organize his farm as to exhaust the possibilities of the clover and the liquid portion of the manure before resorting to the purchase of nitrogen.

One of the factors, therefore, in maintaining the fertiltiy of the soil is to so organize the system of management that all liquids are returned without loss to the soil. The details may vary, but in general it means plenty of bedding and the protection of the manure from the weather until it is drawn to the land.

The idea is as simple as simple can be. How many people practice it?

Another lesson and one very much needed, which these experiments show, is that there is nothing injurious about commercial fertilizers. For thirty years, certain plats in this experiment have received no stable manure. No organic matter has been added to the soil, except that which was furnished by the roots and stubble of the

crops grown. These plats are not only as fertile as they were thirty years ago, but they have yielded and continue to yield as good as adjacent plats which have received yard manure every other year in place of commercial fertilizers. Here emphasis should be placed upon the fact that these results were obtained in a four-year rotation of corn, oats, wheat, and clover and timothy. Thus every fourth year a good strong sod of clover and timothy has been turned over for the succeeding corn crop. If in place of plowing this heavy sod once in four years, the field had been mown for a number of years until the hay was no longer worth cutting and the soil had lost the abundant supply of roots, the result would undoubtedly have been different. One of the important factors in maintaining soil fertility is the plowing down of a dense thrifty sod at regular intervals. It is the nearest approach to a virgin soil that we know how to produce.

While the lesson is perfectly clear that it is entirely possible to maintain the fertility of the soil by the use of commercial fertilizers alone, it is no less certain that it is neither good farm management nor good public policy to organize a farm for the growth of the staple farm crops without including in the system domestic animals to consume a portion of the products raised.

A farm should be so organized as to make the most economic use of the crop residues. Under such conditions, it will ordinarily be necessary to supplement the manure made upon the farm with purchased fertilizers. The matter resolves itself down then to a question of rotations with a suitable combination of yard manure and commercial fertilizers.

Upon this basis, I venture to suggest the best judgment of the Station as to methods of fertilization which will maintain the fertility of the soil and at the same time give profitable returns during a series of years, at prices which have ruled during the past fifteen years. It should be noted that the suggestions here made cannot be said to be demonstrated by the thirty-year experiment. The results of these experiments have been published from time to time and can be secured by anyone who may desire to study them. What is proposed this evening is to venture some opinions as to the direction in which these experiments point. It is intended merely as a guide for those who wish to apply the results of long and systematic investigations on the subject of maintaining soil fertility. Like any other prescription, it will need to be modified to meet the needs of the patient.

The following table suggests several rotations:

TABLE SHOWING METHOD OF FERTILIZING CROP ROTATION.

3 yr.	4 yr.	5 yr.	7 yr.	
			1	Corn: 6 to 10 loads of manure and 25 pounds of phosphoric acid.
1	1	1	2	Corn: 6 to 10 loads of manure and 25 pounds of phosphoric acid.
	2	2	3	Oats: No fertilizer.
2	3	3	4	Wheat: 50 pounds each of phosphoric acid and potash.
3	4	4	5	Clover and timothy: No fertilizer.
		5	6	Timothy: 25 pounds each of nitrogen phosphoric acid and potash.
			7	Timothy: 23 pounds each of nitrogen, phosphoric acid and potash.
		5	6	Timothy: 25 pounds each of nitrogen, phosphoric acid and potash.

Four rotations have been outlined. There is a seven-year rotation consisting of corn, two years, oats and wheat each one year, and hay three years. It is obvious that a six-year rotation could be obtained by omitting corn one year or hay one year. By omitting corn and hay each one year, the five-year rotation would be obtained. The thirty-year fertilizer experiments contain the same four-year rotation as the one here out-lined. No plat in these experiments has been fertilized as here suggested, but several have approximated it sufficiently and make it reasonably certain that the method here outlined for a four years' rotation would indefinitely maintain the fertility of the soil if the land is well drained, either naturally or by means of tile, and the land is kept properly supplied with lime. In the three-year rotation, the crops may be corn, wheat and clover, or corn, oats and clover without in any way modifying the fertilizer. The Experiment Station has been having most gratifying results in using the three-course rotation of corn, wheat and clover in building up run down soil, without manure, using commercial fertilizers on both corn and wheat, when no manure was used on run down soil, eight to ten pounds of nitrogen per acre were added to the fifty pounds of phosphoric acid and potash. The quick response to this method of fertilization was doubtless due in part to the two applications within five months, in May for the corn and in September for the wheat. When manure is available for corn, and is supplemented with phosphoric acid, even better results should be obtained.

A few propositions may be laid down categorically, as follows:

It is not good farm practice to use a commercial fertilizer containing a single fertilizer ingredient, except as a supplement to stable manure. Stable manure on the other hand should be supplemented with phosphoric acid in order to balance the relative excess of nitrogen and potash.

The amount of potash that should be applied to soils in Pennsylvania in connection with phosphoric acid will depend upon the amount of hay, straw and other crop residues that are consumed on the farm. If the domestic animals are fed largely upon hay and silage and bedded heavily with straw, less potash will be needed than if hay is sold and bedding is used sparingly. Hay, straw and other crop residues contain a relatively high percentage of potash and a low percentage of phosphoric acid. In grain and other concentrates, this condition is just reversed.

Where both yard manure and commercial fertilizers are employed, it is probably best to apply the manure for the corn and the fertilizers for the wheat. Lime, phosphoric acid and potash are essential to a vigorous growth of clover.

Corn should not be grown in Pennsylvania on land that does not overflow without either an application or manure or commercial fertilizers. If sufficient yard manure is produced to cover two-sevenths of the cultivated area annually, then corn may be raised two years in succession in a seven-year rotation. If yard manure is lacking, then commercial fertilizers should be employed adding ten pounds of nitrogen to fifty pounds each of phosphoric acid and potash.

No hay field in Pennsylvania, unless it overflows, should be cut more than one year without the application of fertilizers. The evidence seems fairly conclusive that there is no ordinary stable crop where commercial fertilizers will bring a larger return than on grass lands.

More important even perhaps is the fact that herein lies the most efficient and economical method of building up the fertility of the soil. As previously stated, an essential feature of the maintenance of soil fertility is the plowing down periodically of a thrifty, vigorous sod. One of the weakest points in the system of farming in some sections of Pennsylvania is the fact that the hay fields are mown until the grass becomes thin and the roots have largely disappeared, so that both organic matter and available plant food has been decreased instead of increased as it should have been.

If sufficient yard manure is available, equally good, if not better, results may be obtained by using manure as a top dressing in place of commercial fertilizers. In some cases, indeed, it may be good practice to use the yard manure as a top dressing for the hay fields and apply the commercial fertilizer to the overturned sod for corn.

Director Brooks has probably studied the problem of growing grasses longer than any other Station Director in America. His Station probably has more experimental data bearing directly upon the production of hay and pasture than any other Station in this country. Doctor Brooks in a carefully prepared public address recently stated that there were soils in Massachusetts which would be worth $300.00 an acre on which to grow grass when hay was worth twelve dollars per ton.

In order to secure a return which would justify this capitalization, he recommended an annual application of forty-five pound of nitrogen, twenty-five pounds of phosphoric acid and fifty pounds of potash. The Pennsylvania Station, however, following the results largely of the Cornell Station, is recommending the application of twenty-five pounds each of nitrogen, phosphoric acid and potash. This is equal to the application of 350 pounds of a 7-7-7 fertilizer, or 400 pounds of a 6-6-6 fertilizer. The complete fertilizer as usually prepared is relatively too low in nitrogen and potash and too high in phosphoric acid to secure the best results when applied to grass.

The quantities above mentioned, viz., twenty-five pounds each of nitrogen, phosphoric acid and potash, may be obtained approximately by mixing 150 pounds of nitrate of soda, 150 pounds of phosphoric acid and 50 pounds of muriate of potash.

Not quite one-fourth of the farms in Pennsylvania are operated by tenants. This fact has an important bearing on organization for soil fertility. If the land is to be built up or even simply maintained by means of a five-year rotation, the full effect of the fertilization, which was given to the corn crop in the first year of the first rotation, will be obtained until the last hay crop is harvested from the second rotation in the tenth year. In the fertilizer experiment at the Pennsylvania Station ample returns have been obtained from the use of both yard manure and commercial fertilizers, taking an average of thirty years even at prices of products considerably below the present level. During the first ten years, however, there was not adequate return from either manure or fertilizers, except in the potential possibilities of the soil. The tenant is interested in the very immediate present.

The most important reason, however, for the depletion of the fertlity of the soil of rented farms grows out of the necessities of the landlord.

Investments in farm property follow exactly the same laws as investments in stocks and bonds. The greater the security the less the return: the greater the returns the less the security.

The normal condition is that of a man with an investment of ten to fifteen thousand dollars retiring to town at the age of sixty to seventy years. This man, like all small investors, desires to secure the largest possible dividends. Not content with four to five per cent., which would keep his principal secure, he is anxious to secure if possible eight to ten per cent. He is like an other so-called "wild cat concern" which uses its principal with which to pay dividends.

The exigencies of the small investor in land has dominated the leasing system. It is true that the renter is willing to rob the land. He can do so only when he is permitted to do so, and will do so only when the terms of the lease make it to his financial advantage. Unfortunately, the system of leasing which the landlord has found will pay the largest dividends for the time being is the system which makes it to the renter's interest to deplete the soil.

It is possible to draw the terms of a lease so that a farm of depleted fertility may be built up, or the crop-producing power of a fertile soil may be indefinitely maintained. To bring about this result, it is only necessary to so draw the lease that it is to financial advantage of the tenant to practice good husbandry and to his disadvantage to practice poor husbandry.

Messrs. Foley and Smith, of the United States Departmenof Agriculture, have reported an interesting illustration of this principle, which has been in operation for thirty years in Maryland.. * This particular instance is noteworthy because of the long period of time the system has been in vogue, and because it involves 56 farms, averaging about 280 acres each, or in the aggregate about 24 square miles of land.

The two important features of the system are the rotation of crops and a certain requirement of the lease. The rotation if five years, consisting of corn, wheat or oats, clover, wheat, clover. The important requirement in the lease is that the tenant may sell the hay, straw and stover if he chooses to do so, but in such case he must share the proceeds equally with the landlord. If, however, the tenant chooses to feed the hay, straw and stover to livestock, he shall be entitled to all the proceeds from the sale of livestock or their products.

These are two extremely simple provisions. They accomplish very important results. This five years' rotation results in two crops of clover in place of one in the ordinary five years' rotation.

Inasmuch as the clover is sown in the wheat or oats of the previous year, clover is grown on four-fifths of the farm every year. The only field which does not have clover growing upon it is that one that is in corn and is receiving tillage. This arrangement guarantees to the soil the nitrogen necessary to raise maximum crops.

In order to secure the largest return under this lease, it is necessary to adopt some system of animal husbandry. The tenant, however, is entirely free to choose any system of animal husbandry. He may practice dairying, raise beef or horses, or specialize in mutton and wool. He may keep livestock enough to feed up the roughage or he may feed his own corn or even purchase concentrates.

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*U. S. Department of Agriculture, Farmers' Bulletin No. 437.

There are other details. It is my purpose merely to point out these two simple and essential features which might be made a part of any lease. To repeat, the essential features are a rotation which supplies nitrogen to the soil, and a lease which requires the tenant to practice good husbandry in order to get the greatest financial advantage from it.

What have been the results in the instance above cited? There are three persons or classes of persons interested, viz., the tenant, the landlord and posterity.

The fifty-six tenants are permanent because the lease is a favorable one. They live in good houses. They educate their children well. Many of them have bought other farms which they rent.

The records for thirty years show that the fertility has been maintained fairly well. The yield of corn on these estates has been higher than that in Iowa. The yield of wheat has been higher than that in Kansas. The yields, however, have not been unusual. They have not been what they might be made with more intelligent fertilization.

The landlord is estimated to have received during thirty years from this twenty-four square miles of land about 5½% on his investment. In the meantime his land has so increased in value as to make the total interest on the investment between eight and nine per cent.

The organization of the tenant farm is one of the most important problems in connection with the maintanence of soil fertility in Pennsylvania. The writer would urge upon the Institute speakers that, if they have not already done so, they study carefully and with an open mind the whole problem of tenant farming, and that they make it a prominent feature of their institute discussions. It is not a subject to be handled lightly. It requires deep study, and unprejudiced mind, and a willingness to say some things frankly.

Some time ago a graduate of the School of Agriculture of the Pennsylvania State College, who had just been employed to manage a farm, came to the office to discuss some questions of organization. A sheet of paper was passed across the desk on which he read the following:

"Mr. T. E. Martin, Rush, N. Y., is one of the most successful potato growers in the United States. He has a farm of 57 acres of the Dunkirk series of soil. He has three 18-acre fields in a rotation consisting of potatoes, wheat and clover and alfalfa. Mr. Martin has increased the yield of potatoes from 60 bushels per acre in 1892 to 417 bushels in 1906. In 1906, he produced 7,510 bushels on 18 acres. In 1907, he sold $2807.89 worth of potatoes from 18 acres, or $160.00 per acre. He attributes his large yields mainly to drainage, through preparation of the soil, good tillage, spraying, clover and alfalfa, manure and commercial fertilizers."

"Huh," said the alumunus, "that is about everything."

The philosophical editor expressed very much the same idea while walking over the experimental field of the Pennsylvania Station, when he remarked "Every farm should raise a field of alfalfa. It is a liberal education."

Keeping up the fertility of the soil means doing about everything. It means practicing good husbandry. The Pennsylvania Agricultural Experiment Station believes that the results of the thirty years' fertilizer experiments justify the belief that it is possible under existing prices for the fertilizers and farm products, to maintain economically the fertility of the soils of Pennsylvania indefinitely, provided they

are well drained, contain plenty of lime and good methods of husbandry are practiced, and provided further the soil is now fertile or was once fertile.

Land that was never fertile is excluded from this discussion.

MR. STOUT: Mr. Chairman: It has been suggested that if there are any questions, we should write them out. If these are handed to the doctor, will he answer them? According to report of the Massachusetts Experiment Station, the use of raw bone meal is not profitable in comparison with dissolved phosphate. The proportion of crop products in three year tests, the yield of bone was equal to 17 lbs. of crop, compared with a hundred pounds of crop by dissolved phosphate. Please give your opinion.

DR. HUNT: I don't think the Pennsylvania Experiment Station has made any actual experiment on this very important question. The Pennsylvania Station conducted for twelve years some tests in reference to bone meal, rock phosphate and acid phosphate, but it was found as the result of these experiments that the character of the phosphate did not materially affect the result, where the manure was used alone. On the other hand, the last experiments made at the Ohio Experiment Station by Director Thorne, where he has used rock phosphate and acid phosphate with the manure, is to the effect that the acid phosphate gives rather better results. In our experiments, a low grade of ground meal gave us most excellent results. I don't believe the last word has been said on this subject. I want to say to your farmers that when I say they get good results with acid fertilizer, I mean to say that this is so because we have used it. We have not used rock phosphate enough to know just what the result will be. I think the farmer will get results with rock phosphate, but I am not prepared to say how good, because we have not investigated it sufficiently to give the farmers of Pennsylvania positive information on that subject. Since I have been in the State, we have not had money enough to conduct experiments as we should. That is the best information I can give you.

MR. WOODMAN: Dr. Hunt, you said that commercial fertilizer gave better results when applied to grass land then anything else?

DR. HUNT: I am inclined to believe it. I think in a crop rotation I would use the manure on the corn; if you have plenty of manure, use it by all means.

MR. WOODMAN: I get better results by using the manure on the grass and applying the fertilizer to the corn.

DR. HUNT: There can be no objection to that.

The SECRETARY: If you were going to plow that land down for corn the next year, could you not apply it when you made your hay?

DR. HUNT: It becomes partly a practical question. If you get time, you apply it in the summer or fall, but your manure is made

largely in the winter, and you apply it when you have it. If you save it until the next summer and apply it then, the manure will not be the same as to character, so it becomes largely a practical question; it also involves the time of the hauling the manure, so it resolves itself largely into a practical question.

MR. SEEDS: Do you use the same kind of commercial fertilizer on clover as on timothy?

DR. HUNT: I have not advocated the use of any on clover. If you look at this chart you will see that. You can get a first crop without the use of any fertilizer, but if you apply manure to the corn and fertilizer to the wheat—the corn is to be there but one year. If you are going to keep it there any longer, you will have to plow down a dense sod before you make it, unless you fertilize.

MR. GOODERHAM: We are interested in this question, and I think it would be well to take up the matter of freight on manure as well as on lime. I went into the city to get some of the manure the stables were trying to get rid of, but found that the rate of freight from Pittsburg, one hundred and fifteen miles away, made it impossible to get it. I don't see why this should be.

DR. HUNT: I did not know that this question had come up, important as it is.

MR. STEVENS: I would like to take up this question of lime. So far as I know, in the East ground limestone has not been put at a price that the farmers can afford to use it. When the time comes that the East can put out this lime stone at the same price as the Middle West, the railroads will do their part.

DR. HUNT: It is desirable that the railroads shall be sure of the fact that it is a pure ground limestone; otherwise it would be a loss to the farmer.

MR. STEVENS: Yes, sir; but recently I was authorized to offer a certain rate on ground limestone, provided it would be guaranteed that it was ground limestone. This the shipper would not do. Of course the deal was off. Then take the matter of manure. I went into the matter with the railroad and they were willing to make a rate, but the Intercommercial Committee had a rule that our cars must be thoroughly cleaned and fumigated before they could cross the State line. You will therefore see how prohibitory it is if the manure has to be taken out of the car, and the car cleaned and whitewashed and the manure reloaded, in order to get it across the State line. It is not the railroads that are arbitrary about it.

MR. GOODERHAM: Would that apply to the State?

MR. STEVENS: I can't say what the local conditions are. That refers to the interstate rate. In shipping from Jersey City, the manure must be taken out of the car, and the car fumigated at Phil-

lipsburg, before it is allowed to cross into Pennsylvania. I cannot see the reason for it, but it is a matter over which we have no control.

MR. KESTER: Dr. Hunt, in my own experience I have found that organic mulch applied to sod land during the hot months of August and September produced very beneficial results. Have you any information or suggestion as to the beneficial effects of organic mulch on the soil? Now, I have asked chemists this, and they cannot answer. Is there a better condition of nitrogen to the soil from the bacteria?

DR. HUNT: There is not any kind of doubt about that, Mr. Kester. Any condition where you have moisture and proper heat and shade, will be the condition in which nitric acid is formed. The explanation of it and the classification of it have never been experimentally demonstrated. You may say qualitively that it is so, but you cannot say quantitively that it is so. Personally, I think it is very important.

MR. DAVIES: Do you get as good results from the lime you burn?

DR. HUNT: Yes, provided you use twice as much. As a matter of fact, in our experiments we get as good results—better results—from two pounds of raw ground limestone than from one pound of burned lime. It don't make very much difference when you put it on, or how you put it on, just so you put it on.

MR. STOUT: Just so you get it on in the proper proportion.

DR. HUNT: You will have to buy your limestone at one half the price of the burned lime, in order to equalize it.

MR. GOODERHAM: How about the freight?

MR. SCHULTZ: Which is the most lasting quality?

DR. HUNT: It does not make any difference.

A Member: Is the one available as soon as the other?

DR. HUNT: It does not make any difference. As a matter of fact you get just a little better results with the ground limestone, provided it is finely enough ground to pass through a 60″ mesh.

The SECRETARY: Does it make any difference in price?

DR. HUNT: Sometimes; you must use twice as much. That is largely up to the railroads. Mr. Stevens says they are willing to make the farmer a rate provided they can be guaranteed that it is pure ground limestone.

Mr. SCHULTZ: How should it be applied—on what ground?

DR. HUNT: The lime? We prefer to apply it to plowed land, although, as I said before, it is important only to apply it. It has been our custom to ply it when we plow for corn, but I don't think it matters. You want to get it on your land once in a rotation, or once in two rotations. With lime cheap and labor dear, so when we put it on, we put on enough so that we will not have to do it again in ten years.

A Member: How many bushels to the acre?

DR. HUNT: Fifty bushels per acre; that is about a ton and a half. That is three tons of raw limestone and a ton and a half of burned lime. That is just about twice as much as is necessary to make our land grow clover. But it pays. Our experiments show that that land will continue to grow clover until it needs fifteen hundred pounds of burned lime to the acre. When land has got so it won't grow clover, it should be limed, and our experiments show that it will then require at least fifteen hundred pounds to get it to produce clover again.

The SECRETARY: One of the facts that we are to deduce from this discussion is, that if the railroad has a guarantee that it has pure lime the farmer will also get it?

DR. HUNT: Yes, sir.

MR. HOLMAN: What is the cost of grinding it fine enough to go through a 60″ mesh?

DR. HUNT: I don't know.

MR. GOODERHAM: Dr. Hunt, if the railroads asked for a guarantee from the lime men would it have any effect on the farmer?

DR. HUNT: I don't know, but I think it would.

MR. PIOLLET: Dr. Hunt, can you raise clover with lime without any manure?.

DR. HUNT: Suppose you have a piece of land on which you wish to raise clover and it does not raise clover, you can plow it up and lime it, or you can put it in corn and apply manure, and then put on 10 lbs. of nitrogen and 50 lbs. of phosphoric acid and potash. Take up your corn, put in wheat and apply 50 lbs. of phosphoric acid and potash. If your land ever grew clover, it will grow it again.

MR. HOLMAN: Does it matter from what source phosphoric acid is derived?

DR. HUNT: I suppose most of it comes from bone, rock &c. I don't think it matters much so long as it has been treated to make it soluble.

The CHAIRMAN: Doctor Hunt has given us a very good talk, and been very busy. I wish to say to him that up in Tioga county we have been very much interested in this subject. There are hun-

dreds of acres up in our county today with which something must be done before we can get a crop. Some eight years ago we built the first road from Mansfield to Bloomsburg. From down the road some where they shipped a lot of limestone to put on that road, broken up from the size of an egg to the size of a pebble. What I want to get at is this: The road is practically worn out, but the dust from this limestone blew over the fields down along the river bed—sandy land, mostly— and where the limestone got to, the clover is growing when it won't grow anywhere else. We live in a neck of the woods where the freight rates make it impossible to get lime. I have been very much interested in the discussion.

I have here a note signed by John A. Biles, President of the Bradford County Historical Society, stating that their museum will be open every afternoon this week from four to six, and extending a cordial invitation to the members to visit it.

We will now take up the next subject, which will be "The Farmer and the Chestnut Blight," by Prof. Samuel Detwiler, Executive officer of the Chestnut Blight Commission, Philadelphia.

Prof. Detwiler spoke as follows:

THE FARMER AND THE CHESTNUT BLIGHT

By PROF. SAMUEL B. DETWILER, Philadelphia.

It is interesting to note the position of chestnut in the lumber world and as a factor of importance in Pennsylvania's lumber industry. The economical advantage of accurate utilization data to buyer and seller has been proved by the United States Forest Service, through its wood utilization Bureau. Many of the Eastern states also have a bureau similar to that of the National Forest Service. According to the government report on wood products in 1909, approximately 1944 mills were sawing lumber in 1909, approximately 1944 mills were sawing lumber in Pennsylvania with about five or six hundred planing mills, not including many other wood-working industries. The total cut in the United States for the same year was about 44,510 million board feet, valued at 686 million dollars. Chestnut lumber constituted 14.8%, valued at $10,-701,922. The total quantity cut in Pennsylvania was 1,463 million feet, board measure, valued at 23 million dollars. Of this amount 107 million feet was chestnut. This does not include the ties, poles, staves, mine props and cordwood. It is a well known fact that a large percentage of the cross ties, telephone and telegraph poles are of chestnut. In Pennsylvania there are 7,871,698 acres of timber land over one-fifth of which is chestnut. Knowing these facts, the importance of Pennsylvana's effort to save her chestnut from extinction will be more fully realized. Chestnut wood is used in some thirty different industries. It is one of the few trees that can be completely utilized, since the refuse can be ground up and used for making tannic acid extract.

A large number of people know of the inroads which chestnut blight has made on our forests, but few are acquainted with the ex-

act nature of this new pest. Many cases of "Blight" on chestnut trees, when investigated, proved to be dead or unhealthy trees due to insect attacking, lightning or other common injuries. The real chestnut blight, more properly know as the chestnut bark disease, or the chestnut canker disease, is caused by a fungus (*Diaporthe parasitica),* and is not the work of an insect as some erroneously believe, although insects are no doubt very important in causing the wide distribution of the fungus. It affects all kinds of chestnut in varying degrees, but pure strains of Japanese chestnut have the power of resisting the disease, and suffer little injury from it. Living oaks and other trees are not attacked, so far as is now known, although the fungus has been found on dead oaks and on sumac.

The blight was first called to public attention in 1904, when chestnut trees in the Zoological Park, of New York City, were found to be dying from this disease. However, two reliable observers have reported that they found the diseased chestnut trees on other portions of Long Island as early as 1893, which had every appearance of suffering from the blight. The present extent of the blight is from Massachusetts to Western Pennsylvania, and south to Virginia. In the vicinity of New York, the chestnut trees are practically all killed, except Japanese chestnuts. There are accounts of general dying out of chestnut trees in portions of the South as early as 1824, and again in 1860, 1862 and 1878. It is not known whether this trouble was due to a fungus, or to the attacks of some of the well-known insect enemies of the chestnut.

Few people recognize the blight in time to save the affected trees, as the trees show little outward sign of their true condition until irreparably injured. Chestnut blight infection usually is first called to the ordinary observers attention through the death of one or two branches in the crown of the tree. If this branch is girdled by the fungus in early spring; the leaves turn yellow soon after they come out and the leaves wither much as in the fire blight of pear. When girdling takes place later in the season, the leaves assume their fall color and then turn brown and cling throughout the fall and winter. When a trunk or a large branch is girdled, numerous suckers or water sprouts are sent out from the base of the girdled portion. On smooth-barked trees, a canker usually develops where the fungus is growing. These cankers are areas of dead, discolored sunken bark usually more or less broken by cracks or checks into the inner bark. Old thick bark does not change in outward appearance until a year or more after it is diseased, when it begins to disintegrate and peel from the tree in shreds. After the thick bark is killed, it gives forth a peculiar hollow sound when struck a sharp blow, due to a space between the wood and the bark caused by the destruction of the inner bark.

The body of the fungus growing inside the bark of the tree shows as small, irregular, fan-shaped areas of a bluff-color. However the most reliable characteristic of the disease is the wart-like eruption of pustules which appear on the surface of the cankers. These pustules are about the size of a pinhead and are of a saffron or orange-yellow color, becoming dark brown with age. During damp weather the pustules produce twisted threads of spores, one-sixteenth to one-half inch in length and of a bright yellow clor. On old, furrowed bark,

the pustules appear in the crevices of the bark. There are so many things which may be confused with chestnut blight that until a person is familiar with the disease it is best to have the opinion of an expert, before pronouncing the trouble chestnut blight. When in doubt, specimens of the dead bark bearing the pustules should be sent to the Chestnut Tree Blight Commission, 1112 Morris Building, Philadelphia, for determination. Owners of chestnut timber land who desire to have their holdings examined for the blight or to receive instructions as to the proper method of destroying it, should communicate with the Commission so that a field agent may be sent to give the desired assistance. If chestnut timber owners will watch closely for the blight during the coming summer and report the blight to the Commission as it is found particularly west of the Susquehanna River, it will be of material assistance to the Commission in their work of eradicating the disease.

The only sure means of combating the disease so far as is known, is to cut down the diseased trees and burn the bark of the diseased portion. Since the spores and most of the fungal threads are in the bark, if the diseased trees are cut down, and all of the diseased bark carefully burned, and a strict watch kept for new cases of infection as they occur, the disease may very likely be wiped out. Not only should great care be taken to burn all of the diseased bark from the infected trees, but all of the limbs and branches which are not peeled should be piled and burned over the stump, in order to destroy any infection which may be present there. The chestnut blight fungus often starts to grow on dead limbs. Stumps which have not been burned, should be completely peeled of their bark, and this should be burned on nearby brush heaps. The trees should be barked immediately after they are felled and the bark and brush burned, without being moved further from the stump of the felled tree than is absolutely necessary, since this moving always causes the scattering of spores, thus spreading the disease more widely. It is recommended that the brush and debris on the ground be cut and piled, prior to felling the diseased tree in order to facilitate the complete cleaning up of the diseased bark and branches after felling. That work may be successful, however, it is necessary that *every* owner of chestnut timber follow this plan of cutting the infected trees and burning the bark immediately. A single infected wood lot will re-infect surrounding wood lots, no matter how carefully they may be treated.

The Commission is attempting to establish a quarantine line and prevent the further westward spread of the disease. Spot infections are found some miles in advance of the main line of infection. In prompt removal of these spot infections as they appear lies the hope of protecting the timber in these regions and to the west. It is quite important that the people of this locality and to the west learn to know the characteristics of the disease, so that new infections can be discovered before the disease has spread greatly.

The blight problem in the southeastern part of the State, or where the per cent. of infection is very large, is largely one of utilization of the diseased trees. The advice given to owners is essentially this: Learn to recognize the blight, and keep thoroughly posted on the subject. Look over your land well, at least once each month during June, July, August and September. If you have timber that is in-

fected arrange to market it at once, because a tree infected with the blight will die and the lumber rapidly deteriorates after the tree is killed. Cut all the trees that are at all affected. It would be wise to burn the bark that is infected with the disease and also the bark from the stump, to prevent its spread to your own and your neighbors healthy timber. Be very careful to watch and extinguish your fires. Try to get your woods in a better condition, so that only trees of value will be produced. Try if possible, to get some other species growing in place of the chestnut. By all means favor other species in cutting. Try at least to keep your own timber free from this disease.

The sale or local usage of chestnut timber cut on account of chestnut blight is of the utmost importance to the timber land owner. In many of the completely infected regions in the eastern part of Pennsylvania, cutting the chestnut clear is the only sensible plan, since where the disease is very abundant there appears to be no hope of checking its progress and the only practical plan is to cut and utilize all of the chestnut timber before it deteriorates further. As an illustration, a telephone pole buyer who has been operating on Long Island recently stated that for the last two years he had not found a single chestnut tree which was not diseased, and very few were alive, and that the chestnut timber there was now in such poor condition that it was no longer profitable to utilize the trees. The last tract he cut over contained over 600 trees fit for poles according to his estimate, but when the trees were felled he found that only 250 of them were sufficiently sound for use as poles. He stated that as a rule he had found after the trees were diseased for two seasons, the woods was no longer sound, but was brittle and doty.

Chestnut owners are naturally making inquiry as to the market for the various chestnut products. The Chestnut Tree Blight Commission is endeavoring to be useful to timber owners in eastern Pennsylvania by making its office a clearing house to bring buyer and seller of chestnut products together. A mass of information relating to prices and markets is being collected, and a list of persons desiring to purchase various kinds of grades of chestnut in each locality is kept together with a list of what the chestnut timber owner desires to dispose of. At the present time it is the Commission's policy to force the cutting of diseased trees west of the Susquehanna River only since the real fight must be made in the western part of the State where the disease is just appearing. Logs from infected trees may be converted into lumber, ties, cordwood, etc., after they have been carefully peeled. Telephone poles, posts, etc., are not likely to be a source of danger in spreading the disease, provided the bark has been removed and burned in the woods.

Cordwood may be marketed, but diseased sticks should be burned in the woods, since it would not pay to peel the bark from them. There are several firms in Pennsylvania that purchase considerable chestnut cordwood for tannic acid extract purposes, and some owners of timber land have for years been disposing of considerable quantities of wood in this way.

Several large chestnut orchards are being started in the State this year. In view of the prevalence of the blight and the fact that no means known to be absolutely effective in combating it are at hand,

it seems unwise to spend money on planting any variety of native or European chestnut. The rigid inspection of chestnut nursery stock enforced by the Commission, is not absolutely certain to prevent disease, since in some cases trees may be infected and show no outward signs of it. Furthermore, the blight may appear in the vicinity of a thrifty chestnut orchard and wipe out the investment. It is true that we hope to check the westward spread of blight by cutting out the diseased trees as they appear in the western part of the State, but it is not certain that even this will succeed. In the eastern part of the State we have little hope of doing more than teaching owners of chestnut timber to recognize the blight, and to cut their diseased trees before they lose their commercial value. So far as the treatment of individual trees is concerned, we have so far found no remedy in which can be relied upon, although successful in some cases. By gouging out the cankerous parts with chisels and treating the wood and bark with an antiseptic coating of mixed tar and creosote, and by cutting off diseased branches we may delay the progress of the disease, and in some cases prevent the death of the tree. In most cases, however, all measures for the treatment of individual trees, including spraying, have proved of no avail in the long run.

Persons who are starting chestnut orchards, or contemplating doing so, should know of the danger presented by the blight. If they choose to take the chances after the facts are known, they cannot blame anyone but themselves if their money is wasted. It is quite possible that the blight may be kept out of orchards where a close watch is kept for the first appearance of the blight, and where surrounding woods within a radius of a mile or more are kept clear of diseased trees. Spraying and fertilizing will probably assist in keeping the disease from gaining a foothold. It is also possible that before the blight seriously attacks young orchards, a cheap and efficient means will be found by which trees may be made immune from attack. In that case, those who invest their money in orchards at the present time will be well paid, since the value of the chestnut crop seems destined to become greater each year.

The Japanese chestnut appears to be the only variety which has any power at all to resist the blight, and even this species is not entirely immune. Where the Japanese chestnut is crossed with other varieties as is the case with trees produced from seed grown in this country or Europe, the resultant strains appear just as liable to be attacked as the native variety. Furthermore, the fruit of the Japanese chestnut is not nearly so desirable as that of the Paragon and other varieties as the flesh is tasteless, coarse and covered with a thick leathery skin. If it is desired to plant nut trees, attention should be given to the Black and English walnut. In the southern parts of the state the pecan may be worthy of experimental planting. For fence row trees, cherry, apple, mulberry, or other fruit trees, will not only produce revenue from the fruit, but also may be utilized for live fence posts and for shade. For forestry purposes, red oak and white pine can be highly recommended.

It is believed by many that unusual weather conditions have favored the growth of the fungus, and that it will decline again naturally. It is quite probable also that some medicinal remedy will be found to save valuable individual trees. At the present time how-

ever, the only hope of saving the chestnut appears to be sanitation through removal of diseased trees.

The co-operation of all owners is the end to be desired. If each owner took care of his own trees the fight would be already won. Do your own part and explain the disease and its consequence to your neighbors and friends. The Pennsylvania Chestnut Tree Blight Commission stands ready to give you all help that it can.

MR. DAVIES: Would it be advisable to let the centre grow where you cut down a tree that has been blighted?

PROF. DETWILER: From the most recent information we have, it is our idea that where the trunk has been pealed, the tree can be saved. In Philadephia we have stumps from trees that have been cut for over a year, and they are still alive, but in New York they have not been able to do this. However, these trees were not cut as quickly as we cut them in Pennsylvania. If you will write us, or better still, send us sample, we can tell you positively.

DIRECTOR MARTIN: Will you please tell us again how we can detect the disease?

PROF. DETWILER: Yes, sir: We found our first case in Bradford county within the last day or two. First, you will see the dead branches with leaves still clinging to them. Then at this time of the year, they are girdled with a fungus growth; the leaves are pale, and they do not come to the full size. They turn a pale, sickly, yellow-green, just as though they had been killed by fire. The most rapid growth is in June and July. The appearance changes during this month, soon taking on a fall appearance, and then the leaves and branches soon die. In the city you will see trees standing with one half of the branches dead, but with trunk still alive. You will generally find a dead spot where the fungus starts, and from there it girdles around the live bark of the tree instead of going up and down the branches. If the diseased bark is raised, on the dead tree will be found a yellowish matter composed of minute spores. In addition you will also find a great mass of suckers or water sprouts so that where you see a tree half dead with a great mass of suckers make investigation for the pustules. If you are not absolutely sure, even then, take off one, or two, or three square inches of the bark, and mail them to the Commission and we will determine.

MR. RODGERS: How is this fungus carried?

PROF. DETWILER: That is something we would like to know. These spores are very minute, and if they touch a drop of water, will dissolve at once, but in dry weather they remain intact. It is our idea that they are carried from tree to tree on the feet of birds, and my own idea that they are also carried from tree to tree by ants and other insects. Very few are carried by the winds. It may be that the spores are washed down on the ground by the rain, and when it becomes dry, the wind carries the dust to other trees. We do not know that ants eat the spores, but the trees are full of ants.

MR. HOLMAN: Is it a fact that it cannot affect a healthy tree?

PROF. DETWILER: The infection takes place through a wound in the bark. Every insect has to make a wound in the bark, and the trees are full of insects at this time. When the spores wash down, they get into these wounds, and the whole tree becomes infected. Again, we find marks on them resembling the claws of birds. However, I believe the insects carry the disease. I want to protect the birds. They are only doing what Nature intended them to do— going after the insects.

MR. DAVIES: This blight generally commences at the top of the tree, does it not?

PROF. DETWILER: We first notice it at the top of the tree. On the trunk it does not grow so rapidly on the thick bark and it takes longer to girdle the tree, but in 95% of the trees we have examined, it started on the trunk of the tree at about the same time it did on the top. Mr. Williams, the Deputy State Forester examined 50,000 trees, and finds practically this same condition.

MR. FENSTERMAKER: The question has been raised as to whether it is advisable to burn the stump of the tree; for two reasons: One is, that the tree does not easily start from the burned stump, and the other is, the danger of starting forest fires. If you bark the tree, it will start from the old stump very vigorously, but if you burn it, it will not.

PROF. DETWILER: I have not been in this work or perhaps any other, long enough to be able to speak with much authority on this subject, but I have been in charge of lumbering operations where we burned the stump and got excellent results from the burned stumps. Chestnut, perhaps, is not so quickly to sprout as some others. The trees I was working on were soft maple and birch. Now, we will know more about these things at the end of the season then we do now. We are going at the work here. For instance, we are trying an automatic air sprayer, using crude oil, which will not be so hot that the leaves will be injured. My opinion is that unless the fire is exceedingly hot, it will not effect the tree, because, you know, a chestnut tree sprouts from the roots.

MR. RODGERS: Has there any affected trees been found in the central part of the State—for instance, in Mifflin, Juniata or Huntingdon counties?

PROF. DETWILER: We find a great deal of it in Huntingdon county, on stumps that were cut three or four years ago, where the disease got into the stump two years ago, after the sprouts started. We have found the blight in every county in the southern tier from Washington county all the way east; in the western part of the State we have not found much blight except a few trees in Beaver, and a few in Westmoreland; in the north, we have not found it except in Clinton, Susquehanna and Wyoming.

MR. RODGERS: Do you find any in Dauphin?

PROF. DETWILER: Yes, sir; at Hummelstown we have from 10% to 15% of blight.

MR. RODGERS: Is there any in Juniata?

PROF. DETWILER: Yes, sir; scatter throughout the country in small groups of trees, but not yet thoroughly infected.

MR. GOODERHAM; If you find a tree not very badly affected and you remove the tree, will that do the work?

PROF. DETWILER: We cannot say. We have been at the work only eight or nine months. The work done in Philadelphia has been done systematically, and we have had no return of the blight. But the work Dr. Metcalf did at Washington was not done systematically, and after a year or so, it was found that the disease had been communicated to the other trees.

MR. DEWITT: The State owns a great deal of timber land; who is going to look after that?

PROF. DETWILER: At the last meeting of the Commission, preparations were made for that.

MR. DEWITT: I know about a hundred acres of woodland and they tell me there is a great deal of young chestnut timber. I have not seen it for several years. I don't know whether there is any blight there or not.

PROF. DETWILER: There is very little blight there. We find diseased trees scattered here and there all over the eastern part of the county.

The CHAIRMAN: If there is nothing further, the meeting stands adjourned until 9.30 tomorrow morning.

Wednesday, May 22, 1912, 9.00 A. M.

ADJOURNED MEETING OF THE STATE BOARD OF AGRICULTURE

Mr. Seamans in the Chair.

The CHAIRMAN: The meeting will please come to order. This session of the Board is, as I understand it, a continuation of the session we had yesterday morning for the purpose of passing a Resolution.

The SECRETARY: The purpose of this meeting is to hear the report of the Committee appointed at the last annual meeting. I think Mr. J. Aldus Herr is the Chairman of that Committee.

MR. J. ALDUS HERR: Well Mr. Chairman, some of the members of that Committee are present; and as I understand it, when that meeting adjourned at Harrisburg, it was to meet again and look after special legislation. Since that time there has been nothing done and there has been nothing to do. But I understand there are some persons who have suggestions, which we shall be glad to consider any time. They wish to meet us, but as I understand it, there has been very little that could be done in the intervening time between that session and this.

The SECRETARY: Then I think the Committe had better report progress and be continued.

Mr. J. ALDUS HERR: It is a very difficult thing to do anything when there is nothing to be done.

The SECRETARY: But you are ready to go on with the work at any time?

MR. J. ALDUS HERR: Yes, sir.

The SECRETARY: Then you can report progress.

DIRECTOR MARTIN: This Committee was appointed simply to confer with other committees on the same subject, and cannot very well do anything until the other committees are ready to report.

The SECRETARY: This Committee having reported progress, I move you it be continued to report at the next meeting.

MR. BARNES: I second it.

This motion was duly carried in the regular way.

MR. J. ALDUS HERR: I would like to ask for a little information. When we meet in January, isn't that a little late to do anything on the subject?

The SECRETARY: You will probably have done all that there is to do, before that time, and you will simply report what has been done. The committees Mr. Martin speaks of will have been appointed and will have conferred with them before that time.

MR. J. ALDUS HERR: The Chairman will be ready to meet this Committee tomorrow morning at nine o'clock.

The SECRETARY: I therefore ask to amend my motion that this Committee be continued to report after meeting to-morrow morning. If there is no objection, this can pass without a vote.

DR. CONARD: I should like to offer a resolution, if I am in order. The resolution is as follows:

"Resolved: That a Committee of three be appointed, whose duty it shall be to arrange, if possible, for a meeting with a like committee

to be appointed by the State Livestock Breeders' Association, the State Dairy Union, the State Horticultural Association, the State Bee-keepers' Association, the State Poultry Association, the State Grange, the Rural Progress Association, and representatives of the School of Agriculture and Experiment Station of the State College, for the purpose of federating these organizations and thereby securing their co-operation in all matters relating to the advancement of the interests of agriculture in this state."

I put this in the form of a motion.

MR. JOEL A. HERR: I second the motion.

This motion was duly carried in the regular way.

The CHAIRMAN. Is the Chair to appoint this Committee, or is it to be appointed by some one else?

The SECRETARY: I think so.

MR. JOEL A. HERR: I move that the Secretary of Agriculture appoint this Committee, and keep in touch with it.

This motion was properly seconded and duly carried in the regular way.

The SECRETARY: I appoint to act on this Committee: Dr. M. E. Conard, Mr. J. Aldus Herr and Mr. D. S. Taylor.

The CHAIRMAN: Any further business to come before the Board at this time?

MR. PATTON: Following the talk of Dr. Hunt on the guaranteeing of lime, can't you take some action on the subject, requiring a guarantee to lime, something like the fertilizer question? I move, therefore, that the Secretary and the Legislative Committee be instructed to do something to bring about legislation requiring the manufacturers and sellers of lime to guarantee the analysis of their shipments, whether in bulk or in car.

The SECRETARY: I think possibly the gentleman is laboring under a misapprehension. I don't know the voice, and this is a meeting of the State Board of Agriculture, and only members of the Board may make a motion.

MR. PATTON: I am a member of the Board.

The SECRETARY: Then, I beg your pardon.

MR. FENSTERMAKER: There might be no objection to having a motion of that kind, but I think it is a little ridiculous for the railroads to quibble about carrying lime without a certain percentage of calcium or silicon.

MR. YOUNG: It has to guarantee to the buyer that he is getting something worth the money.

MR. FENSTERMAKER: The risk does not rest with railroads.

MR. KILLAM: In order to get the motion properly before the house, I second it.

MR. SCHULTZ: I think it is an excellent motion; give the farmer all the protection he can get. He needs it.

MR. DEWITT: I live in a neck of the woods where we would like to see that motion prevail. We need lime badly in that country, and we cannot buy it with the freight rates prevailing as they are. As I remember it, the gentleman representing the railroads said we could get rates, if some sort of a guarantee prevailed.

The SECRETARY: If there is no objection, I would like to have this motion amended so as to specify the ground lime, and not the oxide or burned lime.

MR. PATTON: I meant to include all characters of lime.

The SECRETARY: Then that is understood to be the motion.

The question having been called for, a vote was taken, and the motion was found to have been duly carried in the regular way.

MR. KAHLER: If I am in order, I would like to move that we elect delegates to this Normal meeting. I would like to nominate Mr. Posten, a former member of the Institute force.

The SECRETARY: This part, Mr. Kahler, is a State Board meeting, but if you will make your motion to the effect that all persons interested in agriculture, who are in attendance at this meeting, shall be invited to seats in council with us and given the privileges of the floor, they to report their names to the stenographer, it will cover everything.

MR. COWAN: I second it.

The SECRETARY: Now, I would be very glad to have any persons here present their names, and they will appear in the report of the proceedings.

The following persons reported their attendance, in response to this invitation: Mr. E. Monroe Posten, Mr. Edward Piollet, Mr. F. R. Stevens, representing the Lehigh Valley Railroad and Mr. E. S. Fowler, representing the Universal Portland Cement Co.

MR. JOEL A. HERR: I move we adjourn.

This motion was properly seconded and duly carried in the regular way, whereupon the State Board of Agriculture adjourned.

PROCEEDINGS OF THE NORMAL INSTITUTE—Continued.

Wednesday, May 22, 1912, 9.30 A. M.

Mr. D. A. Knuppenburg, in the Chair.

The CHAIRMAN: It gives me pleasure to meet with the State Board in our home town of Towanda. I have been passing over the State a great deal the last few years, and I find we have one of the best counties in the State. It is a source of disappointment to our farmers, as well as to me, that so many of them are unable to be here and meet the Secretary and Dr. Hunt, and the men who go to make up this Board, but it is due to the conditions under which they have been laboring, and they as well as we, must make the best of it. There is no class of men who are received more attention from our State government than the farmer, and we all appreciate these opportunities. The State College is showing some wonderful results from the efforts of the men scattered over the State, and I have noticed this in different states. The people are beginning to realize that without agriculture they are unable to exist. That is, agriculture is the foundation upon which all other things rest.

Some time ago I was at a political meeting in Ohio, and there I heard a Senator speak to an audience of farmers. He said in part: "I have held the plow to turn the deep rich soil; I have followed the old spike-tooth harrow from the rising to the setting of the sun, and I have swung the old grain cradle until the sound of that old tin dinner-horn was the sweetest music that ever fell on my ear."

Some of our greatest men in all walks of life have been the product of the farm.

We have now before us the first subject of the morning, and it will be taken up by a man who has harvested the fruit and knows the tree. He does the work, and gets the money. I take pleasure in introducing our expert orchardist, Mr. F. H. Fassett, who will now talk to us on "Care and Management of the Orchard."

Mr. Fassett spoke as follows:

CARE AND MANAGEMENT OF THE ORCHARD

By F. H. FASSETT, Meshoppen, Pa.

Apple growing in Pennsylvania has become a very important industry. There are several reasons for this. We have more acres adapted for growing apples than any other state in the Union. We have the climatic conditions and the soil that will produce the apples of high quality, and we are at the very doors of the best markets in

the world. With all these natural advantages, it would seem that our Creator intended Pennsylvania to be dotted over with apple trees.

Despite these advantages, it requires close attention to all the details in order to succeed. Success in apple growing depends largely upon "The man behind the gun." I believe there is developing a set of men, under the instruction of our Farmers' Institutes, State College and other agencies, who will be an honor to our State, and who will develop these natural resources, and the old Keystone State will take her place where she belongs—at the head of the apple-producing states of the Union.

Our markets are demanding apples of high quality. If you will study the markets for the last few years, you will find that the apples of high quality are gradually coming to the front and bringing top prices, while those of poor quality are bringing less money. It becomes more important that we shall plant only those of high quality. The same variety will not be adapted for all parts of the State, but we have those of high quality for each section. For practical purposes, we can divide the State into two sections—the northern and the elevated portions of the central. For this section we have the Spy, Baldwin, Rome Beauty, Grimes' Golden and Bellflower for the leaders, while for the southern, and lower lands of the central, we have Grimes' Golden, Stayman Winesap and Jonathan. These lists might be enlarged, but no one will make any mistake in setting these varieties. Many orchards will never prove as profitable as they should, on account of having selected varieties of poor quality.

As an illustration: A farmer in northeastern Pennsylvania purchased the following list of varieties: Fifty Delicious, fifty King David, fifty Ben Davis, fifty Black Twig. We would consider it a mistake to set any of the above varieties except in an experimental way. Thousands of trees are being planted each year that will never live to bear profitable crops.

Many plunge into the fruit business under wrong impressions thinking that the business is all income, and not much outgo, but when they once realize the work necessary to grow a tree, and the continued fight necessary to protect them from insects and fungus diseases, they grow discouraged and throw up the whole job.

There are farms in Pennsylvania with good orchards that are sadly neglected, and practically no returns are realized, that, with proper management, might be made to produce more clear profit than all the rest of the farm.

There are a number of different factors entering into successful orchard management; but to my mind the keynote is the full control of soil moisture. There are two distinct methods of orchard management; each has its advantages, but the central idea is the control of this important element. The question is, which one of these methods is best suited to our orchard, viz: sod mulch, or clean tillage and cover crop. Any system that will hold the moisture where the roots of our trees can get it when they need it to mature the crop, is a correct system. We can add plant food to any of them. My experience, and the experiments under the direction of Dr. J. P. Stewart of State College, demonstrate the fact that clean tillage and a legume cover crop is the most economical method for the control of this great factor. By plowing down each year the legume cover crop, we not

only add plant food, but we are constantly adding vegetable matter thereby increasing the water-holding capacity.

The crop not only depends on the moisture, but some of the fungus diseases are caused by the lack of moisture. Prof. H. R. Fulton of State College, after a thorough investigation of the Fruit Spot, made this statement, as above. Moisture control cannot be emphasized too much. We must study our conditions carefully, and when clean tillage cannot be employed, we must resort to the mulch system.

Spraying is another factor entering into successful orchard management. Most of the spray calendars and bulletins are confusing to the uninitiated. They recommend so many different materials, and so many different applications. For practical purposes, we find that in most cases, three careful sprayings will protect our trees and fruit. Concentrated lime-sulphur solution has come to be recognized as the safest and best contact insecticide; it is also a fungicide, and can be used in all the sprayings. Arsenate of lead is considered the best form of arsenic for the chewing insects. We aim to bunch the different spraying: The first spraying for scale insects, and the larvæ of the bud moth, blister mites, aphids and smooth fungus. This spraying is most effective if left until the buds commence to burst open, and is safe until the blossom buds begin to show pink. The material for this spray is lime-sulphur at a density of 1.03. In getting the density of a solution, use the hydrometer. Test the density of the concentrate, and divide by the density of the spray solution. For example: If your concentrate test at 1.24, and you wish a spray solution of 1.03, divide the decimal of the concentrate by the decimal of the solution you may want. It will indicate the number of gallons of water to use with each gallon of the concentrate. In making your dilution in this way, you are always safe, as the density of the concentrates differs very much. The commercial lime-sulphur solution tests as high as 1.35, while the home-boiled hardly ever exceeds 1.28. The work must be very thorough; every twig and part must be coated with the spray. We should not try to use a pump that will not give us at lease 75 to 80 pounds pressure, and more is better. Use a nozzle making a fine mist.

The second spraying should be done when about 90% of the blossoms have fallen, and while the lobes of the little apples are open. They close up in about six to ten days after the blossoms fall. After they close, you cannot spray successfully. This is the most important spray for the fruit. At this spraying, we are spraying for the larvæ of the codling moth and all leaf-eating insects and fungus diseases, such as apple scab, smooty blotch frog-eye fungi, and the apple curculio. The spraying should be done largely from a tower or platform raising the operator seven or eight feet from the ground, using a ten foot extension rod, 54 degree elbow and two good nozzles on large trees, drive clear around, stopping at least four times. You can then force the spray right into the calyx cup and coat over all the foliage. The one motto is "thoroughness." The materials for this spraying are lime-sulphur solution at a density of 1.01, with two and a half pounds of arsenate of lead added to every fifty gallons of the solution. Do not put the arsenate of lead in the tank until you are ready to go to spraying.

The third spraying, in well-cared for orchards, where tillage is practical, might be dispensed with if the other sprayings have been

well done. When used it should be applied when new leaves have formed and apples have grown, so that there are foliage and apples are not coated with spray materials. This period usually occurs thirty to thirty-five days after the second spraying has been done, using the same materials as in the second case.

With these three sprayings, we can control the enemies of the tree and fruit. The cost of the three sprayings differs according to the trees. A tree with a spread of thirty feet and fifteen years old, should not cost over forty cents per tree. With these sprayings well done, we can rest assured that we will have apples that will bring top prices, and if well packed, we need not be ashamed to put our name and address in each package.

The manner of handling fruit is of great importance. We should pick when fruit is matured, and handle them like eggs, using rigid pail or basket to pick in. An oak stave basket with swing handle is an ideal package to use. With some of the more tender varieties, the basket should be lined, and the pickers wear canvas gloves. Apples should never be piled on the ground. They will soon lose their keeping qualities. They should be taken directly to the packing house, or placed on a canvas-covered packing table and packed directly into barrels or boxes and place in cold storage as soon as possible.

Pennsylvania growers have fallen down in marketing their apples. First, we have not been packing them honestly. We face them up nicely, and then fill with apples that are inferior, and no wholesaler can be found that can stand behind the average barrel of Pennsylvania apples and guarantee them alike all the way through. We must get on to our barrels and boxes a stamp that means something, so that when our apples are offered for sale, the wholesaler will not have to open them to know what the package contains. We must learn to pack honestly, and then learn to stand behind our pack with a binding guarantee. We cannot expect to drive our Western competition until we establish some brand or label that means something so that the wholesaler can guarantee, without opening the package, the fruit to be alike all the way through the barrel or box, just as labeled. This may be accomplished by the Fruit Associations. At present an Association label is looked on with more favor by most dealers, because of the successful operation of such Association in the West. An individual grower may, by honest packing, establish a reputation for his fruit when he can ship by the carload.

I take a decidedly optimistic view of apple growing in Pennsylvania. We cannot expect to always get as good prices as has been prevailing for the last few years. Competition is becoming keener each year, and it is up to us who have all the natural advantages, to cheapen the cost of production and furnish to the consumer a high grade apple, put up honestly, at a moderate cost, and I believe we will do it in the near future. We ought to be enabled to furnish first-class apples at a good, living profit, at one dollar, net, per barrel.

The matter of over-production does not worry me in the least. We will never have too many first-class apples. I can see nothing but success for the careful grower. We have no time or place for the pessimist in the fruit business. You can't spell failure in the fruit business; you cannot point out to me one failure in the fruit business in Pennsylvania, when good methods and good business ability were

employed. I believe there is a bright future for the man who plants apples of high quality and employes up-to-date methods. Apple growing in Pennsylvania is on a sound busness basis, and is bound to succeed.

A Member: How long after spraying with arsenate of lead will it be safe to pasture the orchard?

MR. FASSETT: Well, we never pasture our orchard; but I know some instances where hogs and calves have been in the orchard all through the spraying period, and no bad results have been found, because the solution is so light—two pounds to fifty gallons of water, not to speak of the small amount of the spray that reaches the ground.

A Member: Do you grow a summer and winter Bellflower?

MR. FASSETT: We grow the winter Bellflower.

A Member: The only reason I want to know is, with us the Bellflower ripens about October or November, and it is a very fine apple, but I understand that there are Bellflowers that are not ripe until January.

MR. FASSETT: It may be the same as our Baldwin; up here it ripens late in the Fall; in the southern part it ripens early.

MR. JOEL A. HERR: I would like to ask the gentleman a question: He said it did not hurt the hogs and calves to turn them into the sprayed orchard; is it not because he did not turn them in? I believe he said he did not pasture his orchard.

MR. FASSETT: I didn't turn them in. It was not in my own orchard.

MR. J. ALDUS HERR: There was a gentleman in our neighborhood who sprayed his orchard a year ago for codling moth. I can't tell you now what he used, but within two days after he sprayed, he had lost seven head of cattle. He got the veterinary to hold a post-mortem, and it was found that they died from the effect of poison.

MR. FASSETT: They must have gotten into the arsenate of lead barrel and drank it.

A Member: Isn't it about time for the second spraying?

MR. FASSETT: Yes; in our section. Some varieties of the Baldwin and Bellflower are ready to spray now; the Spy is not quite ready now yet.

MR. KESTER: I read the other day of some experiments made by adding two cakes of laundry soap to a barrel of water, in order that the arsenate of lead might stay better in the emulsion. It is claimed that only 25 per cent. of the arsenate of lead will settle in a given time by the use of the soap. Have you ever tried it?

MR. FASSETT: I never have. We always use a pump with a good agitator, which I think is all that is necessary; our solution is practically the same at the bottom as it is when we commence.

A Member: I read sometime ago that we should never start a new orchard on soil that had never been cultivated. I should like your opinion on that.

MR. FASSETT: I would not want to agree with that. I think the new soil is good for apple trees where an orchard was started without logging; he just dug the holes and put in the trees, and has not a very successful orchard there, about twelve years ago.

A Member: Would it not be running a little risk from root rot under certain conditions? I know of one case here in Pennsylvania where considerable trees were lost from this condition.

MR. FASSETT: Root rot is something that our scientists have been unable to tell us much about, or how to prevent it. There might be in new ground some relative danger of root rot, but yet, to my mind, it would be very slight.

A Member: It is claimed that it is very often found in regions where the poke has been growing.

MR. FASSETT: The condition that causes it has never been fully discovered.

DR. HUNT: I would like to ask a question that is rather difficult to answer, and I don't expect to have it answered definitely, but I would like your opinion as to what is a practical size for an apple orchard. That is, we know that the farmer has to have a certain unit within certain limits. Now, what do you consider about a unit for an apple orchard—ten, twenty, or thirty acres, and what number of apples trees would be a good unit?

MR. FASSETT: My thought along that line has been that about twenty-five to thirty acres is about what we might call a good unit. With more than that, the profits per acre are cut down, and that I believe is the point; therefore I would consider twenty-five to thirty acres a unit.

MR. FENSTERMAKER: I would like to ask the gentleman whether he believes that the indiscriminate planting of apples going on in the Eastern United States at present is going to be profitable?

MR. FASSETT: Well, I believe things are going to sift down. I believe it is going to be done on a more sound business basis than ever before, and I believe that the apples planted under these conditions will prove profitable.

A Member: That will increase the production, will it not?

MR. FASSETT: Yes, sir; my opinion is that we should be able to produce apples at a net profit of a dollar a barrel. That will bring good apples within reach of people who cannot now afford to get them, and still give the producer a good living profit.

A Member: It is coming to that basis.

MR. FASSETT: We have fewer trees in Pennsylvania today than we had ten years ago.

A Member: Bearing trees?

MR. FASSETT: Apple trees. I think the statistics show about 60% less than in 1910.

DR. CONARD: About twenty-five or thirty acres of orchard on a hundred acre farm, about how much help would you have to employ for that?

MR. FASSETT: Well, I have thirty acres, and we employ two men regularly, and, of course, myself thrown in. When it comes to picking time, and gathering the fruit, we employ eight or ten pickers, but the two regular men and myself do all the regular work besides the picking.

DR. CONARD: Do you carry on other farming besides orcharding?

MR. FASSETT: Some.

MR. J. ALDUS HERR: Relative to the production of apples from the amount of apple trees planted, I believe the result will be the same as in other things—dairying, for instance; a large percentage of them will drop out. How many poultrymen are in the business five years afterwards? How many of these orchards will be in existence at the end of twenty-five years? It always works down to the practical man; the others drop out.

MR. FASSETT: That is true, and yet we are practically at the doors of the best markets in the world here, and the West is supplying that market, taking away from us the very cream of that market and that in spite of the fact that we can produce a better apple. When we get down to the point of putting out apples on the market right, and capturing that market for ourselves, I see great opportunities for apple growing right here in Pennsylvania. I believe it is possible for us to grow a good apple and produce it cheap enough to keep the Western man out. I believe that we can do this at a net profit of a dollar a barrel, and grow a good apple and get it to market right, and still have a good living profit at that figure.

MR. KESTER: In answer to Dr. Hunt's question, you do not mean to say that the general farmer with a hundred and twenty-five to a hundred and fifty acres could take more than twenty-five or thirty acres orcharding? You mean a specialist, do you not?

MR. FASSETT: I don't think the average general farmer has any business to put out twenty-five or thirty acres. We need specialists. The man who goes into the fruit business in Pennsylvania today will have to be in love with his business and then he will succeed.

MR. KESTER: What should be the size of the general farm orchard?

MR. FASSETT: Judging from what I see over Pennsylvania, it is pretty small, as a rule.

MR. NORTHUP: Would you recommend putting the winter apple into cold storage?

MR. FASSETT: That has been my practice.

MR. NORTHUP: Sometimes it succeeds, and sometimes it don't.

MR. FASSETT: I have found it very successful.

MR. FENSTERMAKER: I referred to the Bulletin from the Virginia Experiment Station, in which it is said that they are planting orchards in soil like that in the Lebanon Valley and without taking the character of the soil into consideration, and the result will be failure. Now, I think it would be well to caution the people in regard to this indiscriminate planting in any kind of soil, and anywhere. That is the danger.

There are certain kinds of soil, and certain places where the apple will succeed better than anything else, but it is wise to be cautious about this indiscriminate planting.

MR. FASSETT: There has been some complaint along that line in the West for a number of years. I have seen this caution that you speak of, and I do not recommend this indiscriminate planting on all kinds of soil, and by all kinds of people, but I do believe that the apple farm in Pennsylvania is coming because a lot of people are beginning to understand their business better than they did, and I don't believe that this form of speculation is entering into the business in Pennsylvania so largely as it has done in Virginia and in the West.

The CHAIRMAN:Certainly Brother Fassett has given us a very interesting and profitable address on this subject. The next number on the program is an address on "Feeding and Management of Dairy Cows." This is a great dairy country, and we have with us one of the great dairy experts of the State, Prof. Van Norman of State College, who is too well known to us to require any introduction, and who will now address us.

Prof. Van Norman spoke as follows:

FEEDING AND MANAGEMENT OF DAIRY COWS

By PROF. H. E. VAN NORMAN, State College, Pa.

Mr. Chairman, Ladies and Gentlemen: There has recently come into use a new phrase, and the thought and the wish has come into

my mind, that this phrase might be applied in a different way. The phrase is, "Farming with dynamite." I consider it one of the most sensible things that can be applied to the farm today, and I wish the firm that has dynamite to sell would find some way to apply it to the farmer, as well. I believe the best thing that could be done would be to give our farmers a charge of dynamite strong enough to lift them out of the rut in which they are.

This session is composed of representative Institute Lecturers of Pennsylvania, and Chairmen of the County Institutes. This is not supposed to be an average audience, and I fear that sometimes we forget that fact. We are the exception, or else we have no business being here. You are the men who are the leaders in your counties, and you are the men who are going out to help the leaders in your respective counties raise the average man there up a little bit. Now, the last speaker is not an average apple grower on an average farm. He is the exceptional farmer and the exceptional apple grower, and I wish that somehow we could plant in the minds of our speakers the necessity to emphasize the thought that in order to get out of his rut, a man must do somthing more than the average man. Why is it that the last speaker could go out and compete with the Western apple grower? Because he did not sit down in a rut. The Western men got out of the rut, and they can send their apples right in here, where we can produce them cheaper than they can, and we have to compete with them, and can't do it with the average man.

Now, to get down to my subject. I have no patience with the man who tries to run a successful dairy with the average cow. To be successful, he must get rid of that average cow, and get out of his rut. We got some figures from the patrons of our creamery at State College, of which there are one hundred and eighty at the present time, and we found these conditions, viz: That on one farm there were fifteen cows kept; four of them did not pay for themselves, and the other eleven made a margin of two hundred dollars. Now, then, these four cows brought down the average. If they could be disposed of, the other eleven would show a larger profit.

There is one thought that I want to impress very strongly, if I can, in regard to the management of a dairy farm, and that is, that in order to increase our profits, we need not look to our sale price, but we can do it ourselves on the farm. Now, the man who is keeping eleven to fifteen cows and shipping his milk into New York might just as well look into this, because he can not change his price. That price is regulated by the great law of supply and demand, and I don't believe the price is going to change very quickly; whether it is in the next sixty days, or within the next two years, the man who produces milk will have to take the price that is fixed by the great law of supply and demand. So we will eliminate that and take up the next proposition.

The first thing we must do is to eliminate that unprofitable cow and get rid of her very quickly. Why is it that every farm in this county is feeding two or three cows, not one of which pays for her keep? Simply because they are in a rut, and all the College can do, and the Farmers' Institute can do, and all the State Board can do, and all the Railroad can do, all the other agencies can do, is to apply a little bit of dynamite and jolt them out of their rut. Not even the

Legislature can legislate profits into the pockets of the average man. All we can do is to show him how to get it.

Now, after we have eliminated the cow that is unprofitable, what shall we do with the others? I will confine myself to the feeding problem. I will also eliminate the fact of the high price of feed; that is something we cannot control. What can we do? The first thing we can do is to quit feeding that high-priced stuff to the cow that does not pay for it. The next is, that the cow must eat three hundred and sixty-five days in the year and we must feed her something that is worth money. If the feed does not do it, we should add the profit in some other way. We sometimes forget the value of our pasture. We have it, and it must be made to produce some profit. Your cow should be made to produce a profit for every acre that she eats what grows on it.

The next thing is that she must not only be made to pay for her maintenance and her management, but she must pay for what it costs to produce her milk. Therefore the amount of milk produced in one year is a very important feature in the feed of that cow. I am not a very good chalk artist, but I believe some things sink in better through the eye, than through the ears. We have a dollar's worth of milk, and feed her ninety-nine cents worth of feed; where is the profit? If we were to feed that cow a dollar's worth of feed, and get two dollars' worth of milk, there is some hope of there being a little real profit in it. The first thing to do is to know what we are doing. When we come to the feeding point, there are two things that enter in: the first is the ability of the cow to consume feed, and then to supply her with what she needs, not only in quantity, but in kind. Our Experiment Stations have been telling us for the last thirty years about "balanced rations," but it is only for the last five years that it seems to have come down to a practical working basis, and out of it has come the proportions I am giving you this morning. The man who keeps cows may fail to balance his rations, and still show a profit, but it is possible to make a mixture of feeds and feed it to the cow in proportion to her grain feed so as to give her the variety she wants, and be reasonably sure she has enought to give her ability to make milk and take care of herself. The first thing we want to remember is that she must have enough milk; the next thing is that in making up her mixture, we do not simply make a grain mixture.

Now we want to reduce it to figures, and we can do this according to the law of digestible nutrition, and it can be done according to our new standard. The cow must get enough protein, and, second, she must get enough energy to meet her requirements for maintenance and milk production. To many of you the term "energy," I think is new. The best definition of energy is a very short one: "Energy is power to do work." You can measure oats in a quart measure; you can measure oats on the scales; you can measure oats in terms of digestible nutrition. You can also measure these oats in terms of energy—the work they will do. You can put these oats into the furnace and burn them, and they will turn that energy into heat; we can put them into the engine, and they will produce steam; you can put them into the silo, and turn their energy into power, but power comes from the oats. Every feed we have can be measured thus, in the terms of its power to do work. Now you have the explanation. Lay it aside for a moment, and remember that there are only two

things we are going to do—try to furnish that cow enough power to take care of herself and to make her milk, and be sure that we remember that the energy comes from protein. You can get energy from sawdust, but you cannot get the cow to use it. She must have protein.

A thousand-pound cow requires five-tenths of a pound of protein and six therms of net energy every day, three hundred and sixtyfive days in the year. The therm is the unit of measurement, just like a quart of oats, or a gallon of milk. If you want to know more about it, write for the Bulletin on "Computing Dairy Rations." If this cow is going to make twenty pounds of milk that will test 4% fat, it will require one more pound of protein and six therms of energy more, or she will require a total of one and a half pounds of protein and twelve therms of energy per day. Now, if that cow has the ability to make twenty pounds of milk, and you only give her a pound of protein and eight therms of energy, there are just two things that can happen: If she is fat, she will rob her body and put it into the pail; if she is a dairy cow, or if she is not fat, she will not put it in the pail. And wherever you find the cows are not putting it in the pail, if they are dairy cows, they are not given enough to do it with, because Nature has so fixed them that they will take care of themselves first.

Now, if she is to make forty pounds of milk, she will require another six therms, and another pound of protein. In other words, the more milk the cow makes, the cheaper she makes it, because she only has to take care of herself once. Some of our farmers do not think of that. They only think of the amount of food they use, and of the profit. We should think of the returns we are getting.

I wonder whether I have made this plain—that every cow should be fed to the limit of her ability to use it above maintenance. It does not cost more to maintain a twenty-thousand pound cow than any other because the cost of maintenance is practically the same.

How shall we feed our cow, so as to be sure to give her what she needs? Let us use a few figures: A 1000 lb. cow requires 5 lbs. protein and 6 therms for maintenance; if she is to produce 20 lbs. of milk, we must add one lb. of protein and six more therms of energy, making a total of 1.5 lbs. protein and 12 therms of energy for the production of twenty pounds of milk, and for maintenance. I would suggest this rule: feed one pound of grain to every three pounds of milk. Now, that is not the only rule, but it is a safe rule. You can give it to your ignorant farm hand, and if he follows it, you may be sure that there is no danger to your herd; or you can give it to your brilliant son, or to the college man, and your cows will be safe. According to that rule, the cow that produces twenty pounds of milk a day will require about seven pounds of grain, because three into twenty is near enough seven to be called seven. Seven pounds of grain furnish about four therms of energy. Having given her the seven pounds of grain, give her all the roughage—good hay or silo or corn stover—that she will eat up clean, and she will get the other eight therms. By "grain" I mean any of the mixed feeds—corn-meal, cotton seed meal—any of the mixed grain feeds. Grass I should count as roughage. Having, then, given her all the roughage she will eat, she has all the energy she needs, the roughage that furnishes this energy also furnishing a little protein, viz: About half a pound. Now, then, we can make our grain mixture so that it will furnish the other pound. We can make up a grain mixture that every time it

furnishes four therms of energy, will furnish a pound of protein; that will be a 1-4 mixture. Give the cow three quotas of it and all the roughage she will eat, and she is all right.

But the question comes up that I am feeding timothy hay, and the other fellow is feeding alfalfa. Then our mixture will have to be made in accordance with the amount of protein necessary to make up the amount required to produce our quota of milk. For instance, we can use a 1-8 grain mixture. I don't want to confuse you by giving you a whole lot of figures. I simply want to give you the principles, and then you can send for the bulletin and think it over.

We have fed our cow seven pounds of grain, because she is giving twenty pounds of milk. That contains about four pounds of energy; the other eight will come from the roughage; that is the 1-4 mixture.

Has any one any questions up to this?

MR. J. ALDUS HERR: This twenty pounds of milk you are producing, what does it cost to feed? Suppose you use a mixture of silage, cottonseed meal, corn stover and corn once a day?

PROF. VAN NORMAN: I am not a lightning calculator; I will let some one else figure that out.

MR. J. ALDUS HERR: I can't answer that myself; but isn't it possible that a good dairy cow can consume more carbo-hydrates than one of the beef type? I have a beef cow that I must give her corn once a day to keep her in flesh.

PROF. VAN NORMAN: You are a sensible man; you are one of a body of men that are beyond the average; you know your cows.

Now, so far as our experiments show, there is not nearly so much difference between cows as most people think. There is some difference, but not as much as people think. You look after your own feeding?

MR. J. ALDUS HERR: Yes, sir.

PROF. VAN NORMAN: And have you a man you could trust to do the feeding if you were away for six months?

MR. J. ALDUS HERR: No sir.

PROF. VAN NORMAN: Well, that is the point. If you have this rule, you can go away, and be sure that you will have at least nearly as good results as if you were there yourself.

MR. J. ALDUS HERR: Now, we use more carbo-hydrates. We grow corn in our county, and we find it cheaper to feed considerable of it because we know we get better results.

PROF. VAN NORMAN: There are a lot of factors that enter into the question, and which depend upon the individual. I cannot give you any hard and fast rule. Two men will take a pair of horses, and one of them will load up the wagon, and he cannot get started be-

cause one of the horses holds back. The other man gets on and takes the reins and starts off without any trouble. Now, that is not the horse; that is the man. So it is always the man behind the gun; but it is safe for the average man to have a rule, and if he cannot use it, he is hopeless. This way we have no weighing out to do; we simply put it on the barn floor and mix it in the proper proportions, and there we have the 1-4 mixture.

The relation of protein and energy will depend upon the roughage we have. If our roughage is timothy hay and corn stover and silage, or any two of these; then we want to make up a grain mixture about 1-4 ½. If we have a good supply of clover hay with the timothy and silage, then about 1-5 is enough protein. If we have the clover hay, then about 1 to 7 or 8; so that our roughage shall determine the amount of grain our mixture shall carry. I have followed this rule, generally. Here is a mixture of 1-5. I simply give it because I have the figures here:

		Protein.		Therms energ.
400 lbs.	cornmeal, ...	28	.....	352
100 "	cottonseed meal,	35	.....	84
300 "	distillers' dried grains, ...	66	.....	237
100 "	gluten feed, ...	20	.....	71
		149		744

Now, if you will divide 149 into 744 you will find that the result is practically 5; in other words, here you have your 1-5 mixture. If you want a 1-4 mixture, you can use more cottonseed meal or corn and cob meal both of which are low in protein, and high in energy. Suppose you want a 2-4 mixture, take out half of the cornmeal.

MR. McCALLUM: Professor, is there a possibility that there may be an excess of protein?

PROF. VAN NORMAN: Protein will perform the same functions to err on the side of a little too much rather than a little too little.

MR. KESTER: Can you deduct it from one and add it in with some of the others, as we shifted with the carbo-hydrates?

PROF. VAN NORMAN: Protein will perform the same functions as the carbo-hydrates, but we cannot make anything take the place of the protein. Mud will take the place of the brick, but the brick will not take the place of the mud. The difference between carbo-hydrates and energy is that carbohydrates is something, and energy is what that something will do, so we want a mixture of feed so balanced that they will produce sufficient energy to do it properly. Dr. Armsby in his calrymeter has shown that they mature more rapidly if we do this. We do not figure in decimals because you cannot prove to me that your timothy is exactly the same as I feed, or that your cottonseed meal is infallible in this respect; so we use only the whole numbers, which is close enough for all practical purposes.

MR. J. ALDUS HERR: The only objection I have to that ration is that three of those feeds I cannot grow; I must buy them.

PROF. VAN NORMAN: That is getting off a little bit, but I think it is one of the points that should be considered. If I can buy a hundred dollars' worth of feed and get a hundred and twenty-five dollars back, that twenty-five dollars is profit. Or if I can even get a hundred and five dollars for it, the five dollars is profit. Profit is the only element that enters into it. If you can grow something on a hundred acres that you can sell to better advantage and buy your feed, the only element there is what you can buy to feed at a profit. I think a whole lot of men make a mistake in thinking they can consume what they grow at a greater profit than they can buy feed for and feed it. There is no horizontal rule in this any more than there is in anything else. If you can grow on your hundred acres all the silage and roughage your cows will eat and then buy the grain feeds, I believe you will be doing business at a better profit.

MR. FENSTERMAKER: Why not grow alfalfa?

PROF. VAN NORMAN: That is very good; I am simply speaking in general terms.

MR. J. ALDUS HERR: If I don't use what I grow on the farm, there comes the expense of hauling it away, which means labor. And where am I to get a market for my corn and my fodder and my hay, that I grow on my farm, if I buy the high-priced feeds instead of feeding what I grow?

PROF. VAN NORMAN; Use it.

MR. J. ALDUS HERR: I can't; we grow too much.

PROF. VAN NORMAN: Then keep more cows.

MR. J. ALDUS HERR: Can't; we have reached our limit.

PROF. VAN NORMAN: Here we have one of the factors on which the individual has to work. If you have a small farm, or if you have a large farm, and grow more than you can use, then produce your own protein. There comes in your old-time principle that is so often preached—don't buy your high-priced feeds. I say buy them if necessary to feed at a profit.

A Member: Early in your remarks you advised feeding the dairy cow to the limit of her capacity; what is the capacity of a dairy cow; and, second, is there any danger in cottonseed meal?

PROF. VAN NORMAN: I mean in regard to her health, and to the limit of her health. When she begins to store it on her body, she is beginning to exceed her ability, and she loses in production. Some cows seem to have no limit; you can never give them enough.

A Member: Then you had better sell them for beef.

PROF. VAN NORMAN: That depends; if it is more profitable to sell her for beef, then sell her for beef.

But you must take care of her during her trying time. You never see a fresh cow that is not thin during the first two weeks. She is drawing on her energy, and should be fed accordingly.

Cottonseed meal at the price of the last few years, is one of the cheapest feeds you can buy. If you make a mixture of three or four different kinds of grain, you will never have to use much cottonseed meal. Don't feed any one cow over four or five pounds, no matter what she does. There are some men who will feed six or seven pounds.

Cottonseed meal contains some objectionable product which is deleterious in some cases, but you rarely find trouble with it, so that it is considered practically safe.

MR. YOUNG: Is it possible to make a mixture of three of these ingredients that will do almost as well?

PROF. VAN NORMAN: Yes; but care should be taken to have it, as well as every other ration, palatable. Distillers' grains are light and bulky; the gluten feeds also furnish bulk. You might use wheat bran or wheat middlings and make a balanced ration, but your cows will not like it as well. However, I am talking now to the men who are going out to teach the farmers, and I want to give them a mixture that is as nearly fool-proof as possible. The 1-4 mixture is both safe and palatable to your cow.

MR. YOUNG: These feeds we must buy, and we must buy them in carloads. Still the small farmer cannot use a carload and he must get assistance from his neighbors to buy that carload. Now, if he must buy the gluten feeds and the distillers' grains, he must buy two carloads, but if he can subsitute something else for one of them, he needs buy only one carload.

PROF. VAN NORMAN: Where is your State Grange, and your Cow Testing Association? Why don't these organizations get together and take up these things? I want to say right here that in any community, if five or six fellows get together and go to the feed dealer and say to him "we will take five carloads and unload them at the station if you will reduce your profits," he will have no trouble in getting a reasonable price. I have known feed dealers to take a dollar and a half a ton under these conditions, where ordinarily they would want three or four dollars.

A Member: Where a man is not a dairy farmer, but keeps only three cows, is it possible to raise our own feeds cheaper than we can buy them?

PROF. VAN NORMAN: I believe it is, but I don't believe in this half way business. I would only have one cow to furnish feed to, or I would go into the business in the right way. These fellows with five or six cows don't take proper care of them.

A Member: Corn and cob meal and buckwheat help out on the grains, and they help out on the hay.

PROF. VAN NORMAN: That is a practical matter which applies largely to the individual. What is corn worth a hundred?

A Member: $1.75.

PROF. VAN NORMAN: Now, if we buy a hundred pounds of corn meal at $1.75—

MR. COWAN: Where can you buy that?

PROF. VAN NORMAN: I don't know.

MR. COWAN: Neither do I.

PROF. VAN NORMAN: That is something you will have to work out for yourselves. I am simply using this as a basis from which to teach you fellows to figure. If you buy a hundred pounds of corn meal at $1.75, you have your seven pounds of protein at the rate of — one pound would be one-seventh of that, or 25%. At that rate your protein costs you say $25.00 per hundred in corn; this supplies us 88 therms of energy at a practical cost of 2 cents (1-88 of $1.75) a therm or $2.00 per hundred. Now let us take cottonseed meal. What is that worth?

A Member: $1.65.

MR. COWAN: $1.90.

PROF. VAN NORMAN: All right; $1.90, then. At $1.90 cottonseed meal will furnish, say 35 pounds of protein, at 5 cents plus, or $5.00 for protein. The energy in a hundred pounds of cottonseed meal is 84 therms, or a little over 2 cents a therm. The energy in cottonseed meal is just a trifle more expensive than the energy in corn—$2.00 plus.

A Member: At $1.60 or $1.70 it would be about the same.

PROF. VAN NORMAN: Yes, sir. The thing to do is to figure the cost of your feeds in this way, and then determine for yourselves which which is the cheapest for you to buy, and then select the ones that furnish energy the cheapest. Usually it is corn, or corn and cob meal. Take them; what are they worth?

A Member: 75 cents.

PROF. VAN NORMAN: For $2.20 in oats we get eight pounds of protein—about 27 cents a pound or $27.00 a hundred. That is not quite right; yet we feed them just because we raise them on the farm. Now, we figured out this week in our class that the man who had a hundred bushels of oats which he could sell at 50 cents and haul them into town, and allowed him $2.00 for going into town and $2.00 for going back again, could buy the same amount of energy in cottonseed meal and save fourteen dollars in cash and have eighty pounds more protein. Now I want to emphasize two things: First, what are you

getting for what you sell, and next, what does it cost you for what you put back—the same amount, or more? As a rule, at the price of oats in this State, we can better sell them and buy some other feeds. Now, there may be conditions where a man may be justified in holding them. He may have to hire labor, which is expensive. Now, what are buckwheat middlings worth?

A Member: White buckwheat middlings from $23 to $25 per ton. But the cow does not care for it because it is sticky.

PROF. VAN NORMAN: Mix it with something else.

MR. COWAN: Wheat bran or corn?

PROF. VAN NORMAN: No wheat bran for me at $27.00 a ton.

A Member: One member said he raised all his concentrates except bran. Why not raise that?

PROF. VAN NORMAN: Because there is a screw loose somewhere.

Now, I want to review a little bit: The first thing is to feed for maintenance; but the cow is not profitable unless she produces enough for maintenance and milk, so the next thing is to feed for profit, and this can be done by a mixture that is sufficiently cheap, and light and bulky, feeding, as a rule, one pound of grain for each three of milk; or, it may be, one pound of grain for each four of milk; or even, under some conditions, one pound of grain for each two and a half pounds of milk, Now, this is the rule which can be safely followed and it applies to the cow which produces twenty pounds a day, or sixty pounds a day. But now comes the question. How much to give her when she is not in milk? Well, she can live on roughage, if necessary; it is not advisable, but she won't starve to death. Then the next point is to find out at what price the different feeds furnish protein, and use that as a basis for your ration, making a mixture of different feeds for variety. A feed that is too constipating must be avoided and something more laxative substituted. The relation of protein to the energy in that mixture will be determined by the roughage. For timothy hay and corn and bran you will have to use more protein than where you feed clover hay or alfalfa. I believe you can figure out very easily. If not, organize a "Cow Cost Club" and hire a book-keeper to figure it out for you. Carnegie does that, you know, and he would not do it unless it was the best thing to do.

MR. FENSTERMAKER: How about oil meal? Is it too high?

PROF. VAN NORMAN: Well, at the price of oil meal this winter, I would not use it. It is a laxative, but you can get your protein cheaper.

MR. BIDDLE: At the high price of the oil meal this past winter, would not sorghum be a good substitute?

PROF. VAN NORMAN: It is thought to be so, but I would not speak as positively as I would on some other subjects.

MR. GOODERHAM: Up in Cambria, some of the people who were feeding cottonseed meal lost their cows, and attributed it to the cottonseed meal. Those who lost their cows had put little troughs up and let them eat as they wished. Others mixed it thoroughly with feeds and had no trouble. Might this manner of feeding have anything to do with it?

PROF. VAN NORMAN: I don't know. I would not feed over six pounds of cottonseed meal a day under any circumstances, but I have known men to feed as high as twenty.

MR. FENSTERMAKER: Does that include the hulls?

PROF. VAN NORMAN: Sometimes it does, sometimes not. I think a good standard here is about three to four pounds.

MR. GOODERHAM: Mix it with silo?

PROF. VAN NORMAN: It doesn't matter. At the price of hay this last year, the grain feeds have furnished protein cheaper than the hay, and under those conditions it is a good plan to feed as much grain as possible, and as little hay. If you will send for Bulletin No. 114, you will be able to get a little more information on this subject.

DIRECTOR MARTIN: May I have just a word, Mr. Chairman? I want to have a talk with Prof. Van Norman relative to affecting an opportunity for dairy sections of Pennsylvania to avail themselves of a short school of two days, in which they may take up the subject of feeding a dairy cow. Prof. Van Norman has agreed to go into any section of the State where fifteen men will agree to take up the study exclusively for two days or more. Now, I brought out this thought in order that our County Chairmen may take this matter into consideration, and if two or three counties of the State are ready to take up this offer, we will take up the subject and arrange for such schools this coming year.

Before adjournment, Mr. Chairman, I would like to make this announcement: It is our custom to have a Resolutions Committee to act on such subjects as may be brought before it, and I take the liberty of appointing this Committee as follows: Mr. R. P. Kester, Prof. Franklin Menges, Rev. T. J. Ferguson, Mr. S. C. George and Mr. H. M. Gooderham.

The CHAIRMAN: Anything further to bring before the house before closing?

Since there appears to be nothing more, we will now stand adjourned until 1.30 this afternoon.

Wednesday, May 22, 1912, 1.30 P. M.

Mr. F. A. Davies in the Chair.

The CHAIRMAN: The meeting will come to order. All the members will please take front seats, so that if they have any questions to ask, they can be heard. We have been a little lax in starting on time. I think one of the things we should cultivate is starting on time. If it is just as easy for most of us to get here on time, so as not to embarrass the speaker by coming in late, it will be more pleasant for you, and much easier for us. If we are to start at half past one, let us be ready by that time.

The first topic this afternoon is, "Livestock Sanitation," by Dr. C. J. Marshall, State Veterinarian. No subject can be more interesting to the people who are gathered here this afternoon. We are all able to testify to the ability of Dr. Marshall to fill the position to which he has been appointed and the able manner in which he has conducted his duties. We will now listen to Dr. Marshall.

Dr. Marshall spoke as follows:

LIVESTOCK SANITATION

By DR. C. J. MARSHALL, State Veterinarian.

Sanitation means the scientific application of knowledge to prevent disease. Such knowledge may be applied in a great variety of ways. The diseases that are of the most importance from a sanitary point of view are known as contagious or infectious, and are spread from animal to animal or from animal to man.

The losses and suffering from such diseases depends, to a large extent, upon their character, the intelligence, energy and honesty of the citizens in the community in which they occur, and the efficiency of the police sanitary laws, rules and regulations. The losses from some may be controled by the owner himself. In others, it is necessary to put into operation all the powers of State and Federal laws, to check or exterminate them.

It is vastly important that certain diseases should be recognized promptly and measures adopted at once to prevent their spread. This fact was forcibly illustrated. Suddenly, and without warning, Foot and Mouth Disease appeared in Pennsylvania, in eight different places, over an area about 200 miles in length. It was not known at the time that this disease existed in North America, yet it was promptly recognized and reported by the local Veterinarian in every case except one. A carload of cattle, infected with Food and Mouth Disease was shipped to Norristown, Pa., from Buffalo, N. Y., and kept there for one week. They were sick, and a local Veterinarian was called

to treat them. His failure to recognize the disease or to call upon the State for assistance, that would have been furnished promptly and without expense to the owner, resulted in a general quarantine being placed upon three counties and nearly 15,000 farms within their borders. All animals on 25 farms were destroyed. It was estimated, upon good authority, that this unfortunate occurrence inflicted a money loss of $250,000, aside from all the worry, suffering and inconvenience that was necessarily caused by it.

Pennsylvania is fortunate in being provided with means for handling the ordinary contagious and infectious diseases, and also to cope with the most formidable ones that have, so far, been given to us by foreign countries.

The State Livestock Sanitary Board was organized in 1895, to protect the livestock interests of the State from disease. Its organization was well planned and the work has been efficiently managed. Each Legistalature has imposed new duties upon it, and provided a more generous appropriation for extending the work. To some, it may appear, that the appropriations are extravagant. The livestock in Pennsylvania is estimated to be worth $133,219,000, according to the last census. It is also estimated that the annual losses to this industry alone from preventable diseases, amounts to $5,000,000. In many cases, the losses fall upon those who can ill afford to meet them. When these figures are taken into consideration, it will be seen that there is much work to be done, and the amount of money, set aside for sanitary police protection against the disease of animals, is very small. It amounts to less than one cent for every two dollars invested. Every possible effort should be made to guard against losses from contagious or infectious disease. Rigid systems of sanitation are the most efficient means at our command for this purpose.

The most effectual plan for combatting disease in either animals or human beings are to be found in an intelligent application of what is known in reference to cleanliness, ventilation, drainage, light, suitable food, pure water and a judicious amount of exercise.

Cleanliness stands next to godliness. As science unfolds her mysteries, this proverb becomes more and more appreciated. Dirt is matter out of place and matter is anything that occupies space or takes up room. It may range in bulk from organisms, that are too small to be seen with a powerful microscope, to nauseating masses of decomposing animal or vegetable matter. At the beginning of the present generation, a surgeon was judged clean by his looks and personal appearance. His instruments could be cleaned with soap and water and dried with a towel or a clean pocket handkerchief. At the present time he could be prosecuted for malpractice if no better precautions were taken to prevent infection. In his case, cleanliness goes farther than can be detected by any of the five organs of sense. This fact has become well known to all intelligent citizens, and the surgeon, who does not know how to be clean in the fullest sense of the term, has no place in modern medicine.

Disease-producing organisms are all too small to be recognized by the naked eye, yet they are often clothed or concealed in filth that can be seen. They belong to the animal or vegetable kingdom. Science has unraveled many of their pecular characteristics in the past few years. In many cases, it is known how and where they grow,

how they are propagated and the particular form of disease that is produced by each and how they are or may be destroyed.

In some cases the organisms that cause disease in animals are equally as virulent for human beings and are sometimes carried from animals to man in meat or milk or their products.

Much attention has recently been given to the subject of meat inspection by the newspapers. It is claimed that a large quantity of meat from diseased animals is passed for food by Government meat inspectors. This is true to a certain extent, yet such meat may be considered wholesome and harmless.

When this State began to test and condemn cattle for tuberculosis, about 1895, those that reacted to the test were killed and either buried or made into phosphate. In some cases, the owner would sell the hides, but the balance of the animal was lost. Practically every animal that reacted to the tuberculin test would show, on post-mortem, tuberculosis in some stage of the disease. In many cases, it was so recent or so slightly advanced as to interfere in no way with the general health of the animal. In time, such cases would become bad; they were a source of danger to other cattle, eventually the health would break down and the animal become worthless. It might require years for the disease to run its course.

Those who were most interested in tuberculosis of cattle and best qualified to judge, decided that it was best to kill all cattle that failed to pass a tuberculin test. For several years, the whole carcass was destroyed whether the disease was or was not, far advanced. This custom was not followed in foreign countries where Sanitary science was more advanced. It was considered wasteful and useless to destroy all the meat from an animal slightly affected with tuberculosis.

About fifteen years ago the State Livestock Sanitary Board appointed a Commission of Experts, most of whom were physicians and sanitarians of note, to investigate tuberculosis in animals and report their finding in reference to the use of meat from reacting cattle, for human food. The Commission recommended that meat from mild or beginning cases of tuberculosis could be used safely as food for man. It went into considerable detail in specifying just how extensive the lesions might be before the entire carcass should be condemned. These specifications coincided with the regulation adopted by the United States Government, but were not so liberal as those in use in some foreign countries.

Our present meat hygiene laws were enacted in 1907; since that time, cattle reacting to a tuberculin test have been killed under inspection by a Meat Hygiene Agent or some other regular qualified veterinarian. All generalized cases of tuberculosis have been condemned and destroyed, while those showing but slight lesions or the beginning of the disease, are passed for human food. We feel that this course is perfectly right and that the Bureau of Animal Industry at Washington has been unjustly criticized for passing such meat for food. No country has a better or more exacting system of meat inspection than the United States, and none has more careful, faithful or competent Meat Hygiene agents.

More objectionable features exist in reference to butchering and handling meat, than passing animals, slightly affected with tuberculosis for food. The State has but ten regularly employed Meat Hy-

giene agents to look after this work in the whole Commonwealth. There are thousands of rural slaughter houses in the State. Local boards of health, in many cases, have driven slaughter houses out of the boroughs and towns, on account of their unsanitary conditions. They have, too often, located in hovels and shacks a short distance from town where sanitary conditions are abominable. The water supply may not be sufficient to warrant cleanliness. There is no sewerage system and surface drainage only, is provided. In some cases, the filthy habit of keeping hogs around the slaughter house to consume the blood and offal is practiced. Many animals are killed in such places that are extensively afflicted with tuberculosis with no inspection. The diseased parts are often trimmed from the carcass, and the balance of the meat sold for food. The trimmings are consumed by hogs, which are very susceptible to tuberculosis, and many of them in turn are extensively tuberculous when killed.

The advanced cases of tuberculous cattle and swine are most often butchered in local slaughter houses because it is known that they may be condemned entirely if sent to the city, where Federal, State or municipal inspection is in force. Buyers are shrewd enough, in most cases, to leave doubtful cases at home. Boroughs and small towns, where no attention is given to meat hygiene regulations, are, for this reason, consuming the poorest class of meat.

The State has been doing considerable work in the last few years on the subject of Milk Hygiene. It was formerly looked after by the Department of Health. Some felt that this, with Meat Hygiene, should be in charge of the State Livestock Sanitary Board. During the past year the duties of the Health Department were very much increased by its being required to inspect the public schools of the State. The Milk Hygiene work was turned over, last September, to the State Livestock Sanitary Board. Since that time its agents have visited over 28,000 dairies and sent reports of their findings to the Harrisburg office. It has been the custom of the agents to classify the dairies visited into one of four grades: Either excellent, good, fair or bad. The excellent dairies are the very best, or those that are known as "certified dairies," or where every condition is ideal for producing and handling clean, wholesome milk. (You can see one such dairy at Mr. Worth Jenning's farm, just below Towanda.) Of the 28,000 dairies reported, but 15 are marked "excellent." The principal reason why there are not more excellent dairies is due to the fact that such ideal conditions cannot be provided for producing and handling milk at the popular price for which it is sold and consumers generally are not willing to pay more. The vast majority of those who buy milk do not realize the importance of the extreme care that should be exercised in handling it. If they did, perhaps more would be willing to pay the increased price for the extra effort.

The reports show that over 2800 dairies visited are bad. The instructions to the inspectors were to mark dairies "bad" only where the conditions were so extremely bad that they would be considered nauseating or a menace to the health of consumers. They are what might be called scavenger dairies. The greater proportion of them are found near the larger cities, yet there are far too many bad dairies in the rural districts. The principle faults are due to ignorance, carelessness or negligence on the part of the person in charge. Cows may be unhealthy and unclean, the stable dark and dirty, no facilities for

washing and cleaning dairy untensils and no suitable place to cool or store the milk. It is not an uncommon sight to find a can of milk stored in a pile of horse manure over night, during the winter months, to keep it from freezing. In addition to this, the lid is elevated on one side to prevent the milk from being smothered.

Good dairymen should not be compelled to compete with this class of producers, but they are. One gets no more for milk than the other, and what is the use of being careful or painstaking if it is not appreciated. This is one of the principle reasons why bad milk is being shipped and delivered to consumers. It is why sanitarians are so much purturbed by the milk business. It is also the reason that good milk has to be sold for less than it is worth. This is one branch of agriculture that should be restricted to intelligent, capable persons. Even with our best and most intelligent dairymen the subject of clean milk production is not easy, perfect, or profitable.

A farmer who produces milk for sale, either for local or city market, should be equipped to do the work properly or give it up and allow those to do it who are.

In first-class dairies the cows are healthy and kept clean. The tuberculin test is believed in and intelligently used. The cows are groomed every day so there is no dried manure or filth allowed to remain on them during the milking time. The stables are cleaned at least once a day and the manure is not stored around the stable door or in the yard where the cattle and attendants are compelled to wade through it to get out of and into the stable. The manure is spread on the fields in suitable weather. It has been learned that it is not necessary for manure to lay in the yard and rot before it can be used as a fertilizer.

The cows should be well and carefully fed. A dairy cannot return a profit to the owner where roughage alone or spoiled food of any kind is used. The problem of feeding dairy cows has become a science in recent years and the up-to-date dairyman cannot afford to overlook this important feature.

Too little attention is given to the water supply for livestock. Many diseases and much suffering is caused by polluted drinking water or an inefficient amount. The germs of tuberculosis are passed in the faeces. Where supply is contaminated with the manure from tuberculous cattle, the disease may be readily spread to other members of the herd. Water should be provided in troughs where possible, and wells or springs should be protected from surface drainage. Wells, springs and troughs should be kept clean and shade provided where possible.

The stable should be well lighted. Sunlight is Nature's best disinfectant. Dirt and cobwebs should not be allowed to collect in a stable. The floors, walls and ceilings should be swept and a coat of whitewash applied each spring and fall, at least. Cement floors are especially desirable. If plank or earth floors are used, they should be water tight, smooth and dry. Elevated platforms should be provided for the cattle to stand on, so they can lie down without being soiled. Surface drainage is preferable to covered drains for the stable. The ceiling should be reasonably high, the stable roomy and well ventilated. A good cow stable should be as light and as free from odors as the living room in a good dwelling house. Air and sunshine are cheap but absolutely ncessary in any good system of sanitation.

The above conditions are necessary, not alone for appearance and convenience, but cattle fed, groomed and cared for in accordance with modern, sanitary methods, will live longer, give more milk and return better profits to the owner, than those kept and cared for carelessly.

Bradford county is comparatively free from dangerous contagious or infectious diseases. During the year 1911, 1234 head of cattle were tested for tuberculosis in 83 herds. Of this number, 77 failed to pass the test, and were killed and disposed of under State and Federal inspection. The disease was found in but 18 herds, 78% of the herds tested were found free from the disease. The average percentage of tuberculosis found in the county during the year was 6.25 while the average in the State for the same period was 9.95.

Anthrax, rabies, blackleg and glanders are seldom seen in Bradford county. While contagious abortion is quite common in some dairies.

The State is ready to assist, at any time, ridding your herds of tuberculosis or other contagious diseases that may be a menace to the livestock of the county. It has the authority to co-operate with local Boards of Health in Milk and Meat Hygiene, on terms of mutual agreement. In some sections of the State such co-operation has proven very beneficial.

MR. FENSTERMAKER: We have had this year an unusual number of cases of paralysis among horses, and it usually attacks the best specimens.

DR. MARSHALL: Paralysis in the back?

MR. FENSTERMAKER: Yes, sir.

DR. MARSHALL: That is something that can easily be prevented, although it is rarely curable after they get the disease. It usually attacks the best specimens, and it usually takes them while they are working. They generally work all week, and then stand in the stables on Sunday, and then when they go to work again, they are attacked. In the city, it usually takes them at once; in the country it is not so bad. If they stand in the stable for two days, give them half rations and give them a short walk of about fifteen to twenty minutes—that is, if they are the usual built of work horses, short, chunky, blocky. The thin horse is rarely attacked. Is that your experience?

MR. FENSTERMAKER: Yes, sir.

MR. HOLMAN: Doesn't it usually attack the legs?

DR. MARSHALL: No; it is in the back, about the kidneys. It is caused by the horse getting too much feed for the amount of exercise he gets.

The SECRETARY: Do I understand you to say there is no remedy for it?

DR. MARSHALL: Oh, they sometimes get well of it in the country, but in the city they die. There is not so much of it in the country as there is in the city.

MR. FENSTERMAKER: A great many of them died in Lehigh county this summer.

MR. PEACHEY: Do these horses contract the disease if fed alfalfa, or any particular feed?

DR. MARSHALL: I don't think the kind of feed makes any difference. It is the amount of feed in proportion to the amount of work. It may be some other disease you are thinking of.

MR. PEACHEY: No, sir; the veterinary told me it had nothing to do with it.

A Member: Is there any means of knowing tuberculosis without the test?

DR: MARSHALL: You can generally tell when the disease is in the herd; some of them will begin coughing, and get thin, and when there is one case in the herd, you will be pretty sure to find some more, but to detect every case without a test, you can't do it.

A Member: Would you have the test made regularly?

DR. MARSHALL: If you are breeding high bred stock, I believe I would. Very few buyers will take them without the tuberculosis test.

A Member: Then you would not do it because the city people are clamoring for it?

DR. MARSHALL: No, I don't believe I would, although the local Board of Health may make you do it. It has been done in some cases.

A Member: Is that the case in this borough?

MR. GLOVER: Is there any prevention or cure for abortion?

DR. MARSHALL: We have not discovered it yet. The only thing is to keep the cow clean and disinfect everything, and keep her isolated. Anything you can give her will be of no value.

MR. NAGINEY: Any advantage in a man wholesaling milk to have his herd tested?

DR. MARSHALL: No, I don't think so, unless you find dealers who insist upon it.

MRS. FOULKE: The only advantage is that it would prevent its going through the rest of the herd, is it not?

DR. MARSHALL: Yes, that is the advantage; and I would not want to run a dairy without the tuberculosis test.

A Member: How frequently would you have the test made in order to be sure that the animals are free from tuberculosis?

DR. MARSHALL: Sometimes you test a herd, and find 20% of the animals react from the test; then it is wise to have it repeated in six months.

A Member: If you make the test, is it necessary to repeat it?

DR. MARSHALL: No; not unless you buy new cows. I want to say a word about the water. I have gone out into different parts of the State and found some infectious disease break out which can be traced in many cases to the water. In an adjoining county here where a number of cattle died, I found, in looking up their water supply, a good spring back in the woods which had never been cleaned out, but the cattle ran loose there, and the water was filthy, and these cattle were sick for the reason that they did not have plenty of good water. If this spring had been dug out and walled up so that they could not have polluted the water, they would have been well. That is one of the best ways to pass on tuberculosis. The tuberculosis bacteria passes out through the faeces, and in this way it runs through the herd. I think that if the farmers would dig out their springs and wall them up, and provide good troughs for the cattle to drink out of, they would have a very much smaller percentage of loss and disease among their herds.

MR. J. ALDUS HERR: What do you do when a stream runs through your pastures?

DR. MARSHALL: And others pollute it?

MR. J. ALDUS HERR: Not necessarily; your own cattle may do it.

DR. MARSHALL: I don't know what you can do, unless you bring the water to the stables for them to drink.

MR. SCHULTZ: You mean to say that your herd would not contract the disease unless it came into contact with other diseased animals?

DR. MARSHALL: Your statement is a little strong; there are so many ways that cattle may take the infection—possibly from a neighbors' herd in an adjoining field, so that it is wise to have the test made every now and then.

MR. SCHULTZ: Then if the disease was stamped out in a county, so that it is entirely free, the cattle could not take it even by catching cold?

DR. MARSHALL: No; for the common term "catching cold" has nothing to do with it except to put the cattle into a position to take it.

The SECRETARY: The claim is made by some breeders that cattle would rather drink water that is cloudy—that has a little clay with it, than drink clear water. Has that been your experience?

DR. MARSHALL: No, sir: I think they prefer clear water. I don't think, though, a cow will go out of her path to get a drink if she can get a pretty cold drink right out of her tracks.

MR. DEWITT: Is there any way to make a man dig out and give his cattle a clean place to drink if they have a dirty place to drink?

DR. MARSHALL: No sir.

A Member: Is it a fact that cattle like water that is not too cold better than water that is very cold?

DR. MARSHALL: I think they like it about 70 or 80 degrees better than any other way; I doubt whether they like it when it comes up to 110 degrees in the sun in summer.

A Member: That isn't what I mean. If they are drinking the water from a spring where it comes out cold?

DR. MARSHALL: Yes, sir; I think they do.

MR. BOND: Now, Doctor, I have several times seen the cattle come down from the mountain and pass the clear water, and go right into the muddy water. Is it possible that they are after some mineral in that water?

DR. MARSHALL: That is possibly a depraved appetite, such as the birds eating their feathers and so on.

The SECRETARY: It is possible to find men that will turn from water to drink something that is not as pure.

DR. MARSHALL: And a good deal stronger.

The SECRETARY: I believe that a man like that would be a good subject for the Veterinarian.

DR. CONARD: Suppose a man has a little stream and the cattle tramp in it and defile it, and that herd consists of cattle that are not especially healthy, not tested, no special care taken, and the man right next adjoining is keeping a tested herd, or trying to keep it the best he can under the conditions, has he any redress?

DR. MARSHALL: Dr. Conard and I know of just such a case. We know a man who has a tested herd of Jerseys, with no tuberculosis, and his neighbor has a herd that is at least suspected, and they tramp round in his water. Thirty of his cattle failed to pass the test and he thinks they contracted the disease from his neighbors' herd tramping round in his water. I can't tell him that they did, and I can't tell him that they didn't. We know that the germs pass out in the faeces, and they might not stay in the water long enough to drown. I don't know how he can get redress; there is no law about polluting a stream.

MR. NAGINEY: Is the disease communicable from one farm to another where there is no water?

DR. MARSHALL: Very little starts outside; cattle that are housed, it starts very much quicker. I doubt if two more would take it if they were kept outside. But they come in contact by smelling each other, and through the drinking water.

MR. BIDDLE: Can it be communicated from the adult animal to its offspring?

DR. MARSHALL: If taken away from the mother, the calf can be raised without developing tuberculosis. If left with its dam, it is apt to contract it. I don't know how long it is safe to say, leave a calf with its mother. On the State farm we have a number of healthy cattle that react; we have had some of them six years. Our plan is to take the calves as soon as dropped and feed them boiled milk, and none of them has shown any tuberculosis taint.

DR. CONARD: The cow that has been there six years, does she react?

DR. MARSHALL: Yes, sir; and we have a special eye test, in which we drop it into the eye of the animal, and about twenty-four hours afterwards the animal gets conjunctivitis if she has the disease. I have tried it on a cow that had four tests without result, and the matter ran down over her cheeks in the eye test. Sometimes the first test will not show it, but all of the cattle we have tried so far respond to the eye test.

A Member: Will the human contract tuberculosis by using milk from a tuberculosis herd? It is a question that physicians are divided about. I believe myself that it can be communicated from animals to people under certain conditions. In a large percentage of tuberculosis in children, the germ is the same as in tuberculosis in cattle. In the adult human, it is always of the human type. I drank a good deal of milk from tuberculosis cattle myself without any fear of contracting it, but children who are not well and are raised on tuberculosis milk from the time they are born until they are three or four years old are apt to have bone tuberculosis. I have very good authority from physicians for saying this. That, however, is not a matter for the State Livestock Sanitary Board to discuss. We have enough trouble as it is. That is up to the physician and the State Board of Health.

The SECRETARY: You would not hesitate to advise that where lumps in the udders can be felt, it would be wise not to use the milk?

DR. MARSHALL: Yes, sir. In a good many cases the farmers do not know the disease when they see it. Sometimes, as the Secretar says, you will find it in the udder; sometimes it is in her leg, and sometimes the whole quarter is sore and broken out, and in milking, as you so often see near the city, this puss will run down into the milk when the udder is pressed. Another danger is in the faeces from

dirty cattle; usually you will find tubercular germs. Throughout Bradford county you will find many cattle covered with manure, plastered down, and in milking you will agitate this and it will fall into the milk.

MR. HALL: How about the cattle that are kept out doors; are they more susceptible than the human that lives in the air?

DR. MARSHALL: You will find responses in the eye in cattle that are kept out doors, in some cases. I have known Jersey bulls kept out doors to react, and I have known cattle kept in the stable to show proof of tuberculosis. I think farmers make a mistake in keeping young cattle out in the barnyard in winter. It is not well to have them too closely housed, however, if you wish to have healthy cattle. I think if you have an open southern exposure it is well to keep that open. However, that is not in my province. I think Prof. Cochel, who is here, can give you some very interesting figures on experiments made at State College.

A Member: Will they give as much milk if kept out in the cold, as if they are kept warm?

DR. MARSHALL: I doubt whether there is very much difference, although it is generally supposed that it is better to keep them warm. If you let them run out in the cold, or let them drink a lot of cold water, they cannot give as much milk that night, but after you get them used to it, I don't think it will make very much difference.

MR. DAVIES: Cows that are turned out every day, are they not healthier?

DR. MARSHALL: Yes; it is better to give them the fresh air, even if they give a little less milk. Miller and Libby have one of the strongest and best Jersey herds in the State, and they drive them two miles to water every day. They raise unusually strong, healthy Jerseys, and Mr. Libby ascribes it to the fact that they have to take exercise every day. In Canada they are trying the fresh air treatment for tubercular cattle. It is the best treatment for people, and they think it might be the same thing for cattle. But the trouble is that the cow does not live long enough to try it. If she lived to be fifty years old, it might do, but as it is, when she contracts the disease, it is best to get rid of her and get a new cow.

The CHAIRMAN: Dr. Gay not being present yet, we have with us Mr. Evans of the Cork Brick Company, who will present to us for a few minutes, the merits of the article he represents.

MR. EVANS: Ladies and Gentlemen: It has been my pleasure to address some of you before on this subject, which has attracted considerable attention, and is attracting more attention as time goes on. I represent the Cork Brick Company. Our claim is that it is the only practical flooring for horses, cattle and swine. There is absolutely nothing that successfully competes with it. There are materials that

successfully compete with it in point of expense, but that is the only point where it has been beaten out, and with it you get results that you do not get with anything else. A floor covered with this is better than anything else, not even excepting concrete. It will not produce rheumatism, as is often the case with cold, stony pavements. It is a material that has been very thoroughly tested, and found superior to anything else as a flooring for both horses and cattle. It is a matter of dollars and cents for your own consideration, but I am convinced, after extensive personal investigation, that you will get better value for your money than anything else will give you.

I do not feel at liberty to take your time, but I have small samples of the brick, and booklets setting forth the advantage of cork brick, together with the names of many users of it, to which you can help yourselves.

During a period of a little over a year past, there have been over a million bricks laid in the United States; one hundred thousand of these have been sold east of the centre of Pennsylvania, including Delaware, Maryland and Virginia. The United States Department of Agriculture has used it, together with a number of other big institutions, and in every case where it has been used, there is no failure which has been attributable to cork brick. In three cases there were temporary failures, the first owing to the manner in which the brick were laid, and in one case it was due to the brick itself. Therefore I would suggest that if any one among you knows of any one in your section who contemplates putting up new barns, or laying new flooring for the stock, that you call their attention to this material which is certainly a time and money saver.

I thank you for your attention, and I appreciate the courtesy you have shown me today.

The CHAIRMAN: Dr. Gay not yet having arrived, I would suggest that, since we have Prof Cochel with us, we shall be pleased to hear from him.

Prof. Cochel spoke as follows:

ADDRESS OF PROF. COCHEL

Mr. Chairman, Ladies and Gentlemen: I don't know that there is an particular subject for me to talk upon until Dr. Gay arrives, but whether I can fill his place or not, I want to say that I have enjoyed immensely Dr. Marshall's talk on tuberculosis. His ideas have been borne out at State College. We have had more tubercular herds at the college the last three years, from which we have not been able to detect any reaction from those kept outside; all the reactivity coming from those that have been kept in the barns.

Now, as to the quantity of milk, I always turn to Prof. Van Norman, who is at the present time conducting an experiment as to the relative merits of keeping cattle outside and in the barn. I believe it has not yet gone far enough to determine in dairy cattle, but in regard to the feeding of meat-producing cattle, when they are well fed, well bedded and well protected from the rain, they are very much

better outside than if kept in the stable. But you must protect them from the wind and rain.

At the College they have been conducting for seven year a series of experiments relative to feeding animals out of doors, and the result of five years show that we have secured better results out of doors than indoors; the other two years they were the same. Taking the average, we find that the out of doors feeding is better than the indoors feeding. Two years ago we made a record of all the facts that we got. We found that the cattle fed in an open shed, boarded on three sides, but entirely open on the south-eastern side, and kept well bedded, made a more ready gain at less expense than those kept indoors, and they sold for 15 cents per hundred more than those fed indoors. When we went to distribute the profits, we found there was a net return per bushel of corn fed out of doors over that fed indoors in an average barn, possibly a little better ventilated than the average barn.

In the Animal Husbandry Department, they have taken up the buying and furnishing of animals for the market, and we have found several very striking cases in this feeding. One of these is that the hay made from legume crops, such as field peas and clover and alfalfa, we get very much quicker results with our livestock than when we feed millet or corn. We also find that where it is necessary to use corn, it becomes necessary to add cottonseed meal. We have found, also, that silage is one of the most economical feeds that we can use in the production of beef and mutton. We find, that so far as putting on fat is concerned, we get quicker and cheaper results than where it is not fed. Our experiments show that silage is about the cheapest feed we have.

We have maintained this winter twenty pure bred beef cattle. We have kept them in an open shed, boarded on three sides, and have given them all the silage they could eat, with three pounds of corn and one pound of cottonseed meal. This has been a good winter to make the test, the temperature at times, being the lowest ever reached, and they put on more fat and took care of themselves. When sold to the beef market we found they brought four cents a pound, and when put out to grass they were worth six cents, so aside from maintaining themselves during the cold weather, they increased two dollars per hundred in the market. Part of that is due to the increase in the market, but most of it is due to the animal herself.

Now, the object of this experiment is to find something that will produce beef profitably in Pennsylvania. Conditions have been such that the cattle industry has been driven out of Pennsylvania, in the face of the fact that for the past twenty-five years beef has been the one thing that has shown a steady increase in value. If you divide this into five year periods, you will find each five year period showing a greater increase than the one preceeding it, and the prospects are that this will continue, because the last five years have been the highest.

Now, there are many sections where we can feed cattle and finish them for the market, and it is necessary to look for a source of supply that will prove profitable for a man to feed with. We have found that by silage, which produces more per acre than anything else, and by the use of corn, which is the chief chop we grow, we can maintain our beef cattle as cheaply in Pennsylvania as any other state, except

possibly a few Southern states, so we might just as well produce our own cattle, and as good cattle as they are shipped into our Eastern markets from the West.

We have, during this same time reached the highest price for hay. I don't know what it is worth with you, but in our locality it has sold at from twenty-five to thirty dollars, depending upon how much the one man had to sell, and how badly the other man needed it; so we conducted some experiments to determine some other substance upon which to depend for the fattening of our cattle. We have this year fed two carloads of hay, purchased in the stock yards at Pittsburg in November, to two lots of cattle, equally divided, as nearly as possible, as to age, size, and other features. To the one we fed a three-quarter grain ration, and all the silage they would consume; in addition, we gave them two pounds of cottonseed meal per head; the last few months this was increased to a full grain ration. The other lot was given all the silage they would eat, with a two pound grain ration; the last few months we gave them all the grain they would eat. We charged up to these animals the feed used, the silage at $13.50—and your silage yields ten tons per acre—and cottonseed meal at $32.00. The lot that were fed on the heavy feed cost us 70 cents per ton. The corn cost us locally 60 cents per bushel last fall. The other lot cost us locally 60 cents per bushel last fall. The other lot cost us $1.04. In this we made no estimate whatever for the value of the manure, nor for the value of the pork which is usually produced in connection with the steer. The profit from either was greater than the profit from the beef-producing cattle.

The man who is feeding beef cattle from year to year, lives, you will find, on one of the most productive farms in the neighborhood; he sells his crop to himself, and sends the finished product to market. We have come to a point, in Pennsylvania, where we must realize these things. We have a greater market to produce the two year old steer than any other state north of the Ohio River. Our soil, our climate, our local conditions, are such that we can produce him to advantage.

Now, just a word in regard to labor. When we have a considerable quantity of concentrate feeds to dispose of, we find the dairy business more profitable, and where we are farming a comparatively rough farm, with a large percentage land that can be kept in grass, and where labor is scarce and high, there the meat-making animal will fit in very well. The man who feeds cattle in the winter, can attend to his crops in the summer, and thus utilize his time.

But one thing I want to make very plain: the man who wants to go into the production of beef must necessarily make some study of his subject. In the production of meat-making animals which are sold in the markets, rather than to the local butcher, there are conditions which must be studied. Of course, if a man is feeding for the local market, it doesn't matter so much. Our profits depend upon how much we can increase our animals while they are in our possession. When we breed them, the type and quality must be bred into the animal by the man who produces him.

MRS. FOULKE: When a farmer has only a small place and fattens only a few animals, the difficulty with him is to find a profitable market for them when they are ready to go.

PROF. COCHEL: There can be no question of a city market and a good profit, too. We have these in different sections of the State, and can dispose of any animal that will make meat. That is, the demand is greater than the supply. And the prices of the local markets are largely determined by the prices of the central markets. We live fifteen or twenty miles from any central market, but our local market prices are determined by the Altoona market.

MRS. FOULKE: Can you do that with the individual animal?

PROF. COCHEL: Yes; but will find it better to ship in carload lots, because if your local dealer will not give you the price, you can ship them to Philadelphia. If you have only one or two, it will be better to sell them locally, because the freight rates will always detract from your profits. Now, there is another form of market which is in use in this State. While it may not always be under the most sanitary conditions, as Dr. Marshall has pointed out, the farmer can slaughter these animals in the late winter and dispose of them—first, dispose of them as carcasses, rather than the live animal. This gives us three types of market: Slaughtering on the farm and disposing of the carcasses; the other is the market with the local dealer, and the third, is shipping to the central market. There can be no trouble to dispose of meat cattle in any section of the State.

In this connection, I can call attention to one fact, and that is, that Pennsylvania is a roughage-producing state. There is a little area where we are producing crops of grain, but the larger area is roughage.

This is a question that must come up to the farmer of Pennsylvania before long. The solution of the problem is to produce cattle and sheep for the market. Both take on fat on good silage and good grass, and with a proportionately small expense for the concentrate feeds, we can make them fat enough to sell on any market at any time. The greatest trouble that our beef-making farmer has is due to the fact that the animals do not make much gain on grass. I passed through one of the grass-grazing sections of Pennsylvania and I saw two animals to the acre, on the grass; if they are left there until fall, they will not weigh any more than they do now. We find that the winter season is usually the season in which the livestock make the greatest gain.

I think Dr. Gay has come in, so I will yield the floor to him.

The CHAIRMAN: Dr. Gay, I believe, has come in; he will now talk to us on "Horse Breeding and Management." I take pleasure in introducing Dr. Gay.

Dr. Gay spoke as follows:

HORSE BREEDING AND MANAGEMENT

By DR. CARL W. GAY.

Mr. Chairman, Ladies and Gentlemen: The subject assigned me is such a broad one that it might be discussed in a scattering or general way, or it may be summarized under two or three distinct headings; and I prefer the latter.

I would like to discuss that phase of the horse business which pertains to the buyer, and under that heading I would like to touch upon our good friend on the country road, the motor car, and its relation to horse breeding. What I intend to say about the management of horses pertains to what is uppermost in our minds at present—the high cost of living.

No breeder has any business to start with a lot of high priced stock. We must know thoroughly where we are going before we start. We must possess a definite idea before we start working. This is true of every business, but I don't know of any subject to which it applies with more force than it does to horse breeding.

Now, there are two characteristics that must enter into the breeders' makeup. They are consistency and persistency. In the first place, he must be consistent. A man must have a definite ideal in view when he starts in the breeding business, and he will succeed if he keeps at it. First of all, we must adopt our ideals, and then we must be consistent in our attitude toward that ideal. A man can be consistent and still not get into a rut.

Then we must study the market conditions, and modify our product to meet these conditions. We have a man in this State who has been breeding a certain breed of horses for twenty years. He has failed to adapt himself to the market conditions and has kept on breeding according to his own idea. His horses have been thrown out of the ring when competing for the ribbon, not even allowed to enter into the lists, and when I tried to tell him why I had to do this, he told me he had been breeding these horses for twenty years and knew more about it than I did. He is breeding the Shire horse, and is producing the old-fashioned, gummy-legged, monstrous, coarse kind, that don't go today.

After type comes quality. It don't matter whether a horse weighs twenty-four hundred pounds, or whether he weighs twelve hundred, he must have quality. If he doesn't, the market will not accept him. This man started breeding these along these lines twenty years ago. He is consistent, but he can't sell his colts, and he can't win with them in the show ring. He is an outlaw; but he has gone so far that he can't go back. So we must not only have an ideal and stick to that ideal, but we must adapt it to the market. We can be consistent and still deviate a little from the course on which we have started, in order to meet market conditions.

With the introduction of the motor car, we have heard a great deal of discussion pro and con as to the relation of the auto to the horse and the horse breeder. Some of the talk has been extreme. Up in Vermont, Col. Battell objected to having a motor car on the public road in his neighborhood; so he got up a bill prohibiting it, and had political weight enough to have the bill carried. It may have been revoked by this time, but when a couple of years ago when I was up there, this was the case; you could see no automobile on the road leading to his house. There were no autos allowed on the road. But in spite of all opposition the auto has come, and it has come to stay. I know that our horses shy at it and it wears out our roads, and raises a dust, and all kinds of things of that sort, but we may as well face the fact that whether we like it or not, it has come to stay, and it has brought about a new condition. But the case is not lost, so far as the horses is concerned. It is simply a matter of competition which we

must face, and what we want to consider is this matter of competition We don't want to throw up our hands and consider the case lost, and when we meet these extreme specimens we want to be able to meet them with an argument regarding the economical use of the motor vehicles in emergencies, etc., but if you take all things into consideration, I think you will find the horse is still of use.

Look at history, and it is full of just such instances. In early times the horse was used chiefly for war. If you will look about you, you will find that from the fourth to the eighth century the horse was used principally to carry his master to battle in the wars which were constantly being waged. Then came the invention of gunpowder, and it was supposed for a time that the horse had been forced out of business. The war horse of that period was very much like the draft horse of today. He had to carry at least four hundred pounds, because of the heavy armor in which his rider was encased. But the charger didn't go out of business; he was simply turned to other uses.

The horse that made the percheron famous was simply the evolution of the old stage horse that worked in groups of four to six, pulling the old stage coach out of Paris into the country at an eight mile an hour gait before the introduction of the railroads. But with the coming of the railroad into France, these horses were not needed, and the farmers of La Perche realized that they have to do something to compete with the railroads if they didn't want to get out of business entirely. They also realized that the railroads would develop agriculture and commerce, and so they set to work to produce a little different type of horse—one that could be used in the city and the farm, and they made the already famous horse more famous by producing the Percheron or draught horse.

The same thing happened in this country when the horse car was superceded by the cable car, and later by the trolley or electric car. The cry went up that the horse would have to go out of business, but he still continues to flourish.

It is the same thing today with the auto. I am a little of an optimist, but I think you will find that I am right. Why can't we look back and see what people have done in the past and do the same thing today? Let us look for a moment and see what types of horses are affected by the motor car, and then if there are any, is there any type that is being created by the motor car?

We must consider that it is not a case of "hosses is hosses." There are distinctive types of horses that are in use, in different lines of service. One type is used along one line of service, and another type along another line. When a man goes to market, he has in mind the different types of horses he wants, and not simply "horses."

There are five of these general types of horses: Work horses, running from 1750 pounds up; heavy harness, light harness, saddle horse, and pony. We will include the pony. He is in a class by himself, and it is a class that is beginning to be recognized. Now let us analyze these types as they affect the farmer and as they are affected by the auto.

First on the list is the draught horse. He has no business on the farm; his place is in the city where he is used to haul heavy loads on the slippery pavements. If you mate one of these horses with a ton stallion, you will do well to get a ton foal, because the type has a tendency to revert to the original. This is a good horse to breed, be-

cause there never will be a glut of draught horses of two thousand pounds weight. The demand, from present indications, will always be in excess to the supply. He is like the race horse; it takes a good deal of money to get a perfect type. His business in the city is to haul heavy loads from the station to the warehouse, and he must be able to get in and out and move slowly. He is a heavy horse and works best under a heavy load.

Then we have another type—the chunk. He is the contractors' working horse. When excavating or working on a railroad, the chunk is used to carry out the dirt, and he goes up and down the embankment with ease, drawing his load. Can you imagine a motor truck adapted for this? I can't. I saw the other day where one contractor in New York has ordered five hundred head of chunks, to do some excavating work.

For these two types there is very little competition. They are not affected by the auto to any perceptible degree.

The third type of worker is the expresser. This is a horse that must be light and able to draw a pretty heavy load quickly. Now, there is a keen competition for that horse. He is used for delivery purposes, and with him the motor is a kneen competitor for two reasons—speed and popularity. Now, wherever speed is a factor, you will find the motor takes the place of the horse, particularly for delivery in the outlying towns. Then again, the motor is popular. Quite a lot of people take a lot of pleasure in having a lot of furniture unloaded from a motor belonging to one of the big stores, in front of their door. This is particularly so in some of the outside places. Now, this is a horse that has come into competition with the motor for the simple reason that he is a horse whose existence depends upon speed and upon style.

The heavy harness horse is another proposition. He is more or less of a pleasure horse. We have the heavy harness horse to use in the Broughham when we want to drive in the park. The coach horse has been hit just as hard as the expresser. If you will go to the city, you will find motor cars where you used to find coach horses. But even here the reaction is beginning to take place. The "four hundred" of New York are returning to the Brougham and horse instead of using the motor, because the motor is no longer a distinguishing feature of wealth. They are becoming common, and no longer attract the attention that a finely appointed Brougham and horses do. As a matter of fact, I talked to a man the other day who has just sold a pair of coach horses for $2,800.00 and he said he could sell them right along at fancy prices if he could get them perfectly matched. But that is the trouble; it is hard to find a perfect match.

The park horse is entirely a show horse; he is used only for pleasure, and he has come forward wonderfully the last few years, and the readiness with which this horse is picked up is not an indication that he is going out of fashion. He is used by the ultra-fashionable people of wealth, and the more the motor car is used and the cheaper it becomes, the more this horse will be used by them. When anything becomes cheap, they cannot use it, and there is nothing that will attract more attention than a finely appointed Victoria with a pair of fine horses attached.

However, in spite of all this, there is no doubt but that this type of horse is more or less affected by the motor. A gentleman who used to

have sixty head of horses in his stable and drive to the city every day in a four-in-hand, today has only a few old pensioners and rides to his business in the auto. He told me that he prefers the horse, but fashion demands the auto, and he can make better time in the motor. Wanamaker's manager told me recently that in their service the motor was going up, and the horse was going down because people are asking for delivery by motor, but as soon as the fad is over, they expect to go back to the horse as being more reliable and more economical. One firm in New York has already gone back to high class horses. They find them more serviceable and more economical. And it is the same with the coach horse. As the motor becomes more generally used, the coach horse will come back to his own.

Light harness horses are used for two purposes: Harness racing and road work. Some of you know that harness racing is not dead by a whole lot. The prices asked in New York are not as good as usual this week, but the prospects are better. But, as a matter of fact, the road horse has been hit harder than any other horse. With the man whose business depends upon the ground he can cover, the auto has taken the place of the road horse. Take for instance, the doctor whose business depends upon the number of calls he can make in a day. He has adopted the auto as a matter of expediency. I, myself, as a horse doctor, use the auto to take me from the country to the city, and I must admit it is a pleasant sensation, speeding over a good country road, and knowing you will reach your business quicker than by any other mode of travel. To a certain class of business and professional men, the auto has become a necessity. It enables them to live out in the country and still do business in town, and to this extent it affects the road horse.

Next, the saddle horse: Where it has borne down on the coach horse, and had a depressing effect upon the market value of the road horse, the motor has been one of the factors in bringing about an opposite effect on the saddle horse. The saddle horse today is enjoying a degree of favor that he had not enjoyed for years. Dealers simply cannot supply the demand: the prices are extremely high. Only last week one sold for thirty-five hundred dollars. People are paying scandalous prices for the saddle horse today, and they are the men who use the motor cars, too. One will ride for his liver; another because the doctor tells him to do so, and for that reason the saddle is in demand. It gives a man the exercise that he does not otherwise get, in many cases.

The motor is quite a factor in the "back to the land" movement. You know that out in Kansas, for instance, the motor car is very largely used in the country, and the Ford people have reduced the price of their cars so as to put them within reach of almost everybody. It is a hugh social factor too, and will enable a man to get into the country from his business in the city, in twenty minutes, and it is a factor in country life. And anything that will affect country life will have its effect on the horse business.

There never were so many people riding by doctors' orders, or so many people who ride in the parks, and so, while it has had a depressing effect on the coach horse, and the road horse, the motor has boosted the saddle horse.

Now, ponies. They are coming. To the boy, the auto does not come into the same family alongside the pony, and the pony for the children, in the country, is coming more largely into use right along, and with him the auto does not enter into competition.

Now, then, to sum up the matter of competition between the horse and the auto, I think it resolves itself into this: No matter how many motor trucks are used in the State, we have no reason to believe that they will become safe and efficient enough to dispossess the high class draft horse, and the demand, at the present time, is so far in excess of the supply, that there seems to be no possibility of glutting the market by overbreeding this type.

The Chunk: We cannot look far enough ahead to be absolutely certain, but it does not seem possible to substitute a mechanical thing for him.

The Expresser: We can see that the motor truck is better for driving a great distance with a heavy load.. For about town delivery, you cannot get as much service out of a motor. They get better service out of a horse. Frequent stops rack the car, and the wear and tear of the motor car makes the horse more economical for this purpose. The deduction would seem to be clear, that for long distance runs, and to meet the popular demand, the motor is best; while for city delivery with its frequent stops, the horse gives better service. And to this extent this type has been affected.

The coach horse has been hit; but it is a question whether he is going to stay down.

In light harness horses, the road horse has been harder hit than perhaps any other. I don't refer to the trotter, because you can make a trotter out of any type of horse except the draft horse.

For the saddle horse, business is better than before, as the direct result of the motor car.

Now, then, the breeders' duty becomes plain. Breed the type that suffer least from competition. I would not advise any man to go out of the horse breeding business if he is in it, but I would advise him to read the handwriting on the wall, and to direct his efforts in accordance with his best judgment.

Now in regard to management: I said our subject was to be the high cost of living. With hay and corn and oats at present prices, about the most frequent question I get is: "How can I cut down the cost of my feed bills?" Now, to the man who is running a high class stable for pleasure, it is not so important, but when you are on the farm, and have two, three or four hundred horses to maintain, you will see that this is quite an item. The question is how may we reduce this cost. We have a standard, which, of course, is oats and timothy hay, and, generally speaking, we can't improve upon these for various reasons. The first is, the oats are almost a balanced ration in themselves, and so far as the roughage is concerned, it comes in the form necessary to produce digestion. It is almost impossible for the horse to eat oats enough to do this, so the hay becomes simply a filler. He doesn't get enough to eat from the oats, so he gets the roughage to fill up, and to get his digestive organs working. So we must have a filler that will keep him in good form. Timothy hay does that better than anything else, but with hay at $30 and oats at the present price, it is almost prohibitory.

The first substitute for oats would naturally be corn, but to many of us that naturally suggests trouble, because corn is apt to produce indigestion. I lived for six years where they got little but corn, and horses were fed corn and colts were fed corn without any resulting indigestion. I will tell you one reason for that: the condition of the corn. It is all first-class corn and fed in the cob—sort of an original package. Shelled corn takes on the smell of the gin in which it is kept, and the horse is guided largely by his sense of smell. There is little trouble in feeding corn in the cob to a horse. If you shell it, and let it lay around loose, it will begin to smell of the gin, and the horse will not like it, but if you feed it to him in the cob, there will be little trouble with him on that score. The only trouble in keeping a hundred head of horses and feeding them corn in the cob is the matter of the storage of the corn, but there is no reason why it should be fed exclusively. A ration of one, two, three,—corn, oats and bran, is all right, and it is probably safer than an entire ration of corn. This has been an unusual year for corn; they talk about dollar corn; but I would like you to consider the matter. It is the most economical and healthful substitute. Hay will be the most expensive feed you can find, and if you experiment a little with the corn, you will find that your price of feed will come down very materially. Then bran. It is pretty high, but is coming down to normal price, and it is a very good substitute for oats. Bran is one third of the corn ration, and at the Experiment Station it has been found that there is no more satisfactory substitute for oats than bran. Wheat is not good, but bran is very satisfactory.

A Member: How about rye?

DR. GAY: There has not been much done with that so far as I know.

A Member: Is it poison?

DR. GAY: Yes, and there is not much work being done with it. On the Pacific Coast they feed considerable barley, and the Arabs use it almost entirely. You could use a little more barley than oats, even if it has to be crushed. In California and on the Pacific Coast they use it both as a concentrate and as a hay.

Dried brewers' grains—which is the dried corn after the malty substance has been taken out, made into a mash, and used pound for pound for oats, make a fairly good substitute. We can see no difference in the amount of work they do nor in their health, and these grains are much cheaper than oats. Malt sprouts and distillers' grains are not so good, and cannot be fed to good advantage.

MR. DAVIES: Do your remarks apply to colts?

DR. GAY: No: I had in mind the working horse.

MR. GOODERHAM: How much molasses do you use?

DR. GAY: Usually about a pint to a thousand pounds.

MR. HOLMAN: How about ground oats and alfalfa?

DR. GAY: If you are sure what you are getting. Take H. O.—Howley's Oats—for instance; they, and concerns like them, have an enormous demand for the oat hulls, and it is known that these patent feed people are the consumers of these oat hulls. Now, if after an analysis you find it is all right, you can use it that is all right, but you will find that you pay a little more than if you buy the oats themselves, if you consider the amount of protein they contain in proportion to the price. There are some feeds on the market which are dear at any price, because they are poor in protein.

Field peas—these do very well. In Canada they feed a good many peas, and the thrifty Scotchmen use a good many of them. They are very rich in protein, and if fed with bran or oats, or something of the kind, they can be fed so as to do no harm to the horse.

We don't like the malt sprouts or distillers' grains. Dried brewers' grains do very well; but, on the other hand, the Associated Brewers of California, who are working in the neighborhood of three hundred and fifty horses, would not feed their horses any of these grains, but they will sell them to some one else to feed. At least they did five years ago, when I knew them. I think it was prejudice, because we have not found that they do any harm.

Now, the matter of molasses. About the first extensive feeder in the country to use molasses were the Arbuckles. They worked it out, and I found that the price usually quoted was from 10 cents to 15 cents per gallon—a little cheaper than you can get an ordinary farm molasses at from 10 cents to 11 cents per gallon.

The SECRETARY: The last I had was 10½ cents by the barrel.

DR. GAY: At 10 or 12 cents up to 14 or 15 cents it is economical to use it.

The SECRETARY: I get the brewers' grains from a concern in Johnstown and a little buckwheat and some middlings, and then I cut a lot of straw and add it as needed. The molasses is boiled up with water, and mixed afterwards. It makes a sticky mess if you use it as it reaches you, and the horses do not seem to care for it.

DR. GAY: The usual way is to feed it clear, but it makes a mussy stuff especially in fly time. It is better boiled, and you should get better results if you cut straw and mix it.

The SECRETARY: It takes a good deal less hay.

DR. GAY: During the present year it was cheaper to feed more grain than hay. One of the best substitutes for timothy is cereal hay. You take the hay made from oats and peas and you will have a better product than timothy hay, so far as nitrogen is concerned, and it makes a very cheap and satisfactory substance.

Another thing that we don't appreciate is the corn stover. I have seen lots of it out in the field in the last two years, and yet only recently I know of a record sale of 16 cents a bundle for it. Lots of men don't think of using it for feed, but it is a good thing.

A Member: How much will you reduce the grain ration when feeding the cereal hay?

DR. GAY: Well, I would reduce it a little, but not very materially, I believe.

The SECRETARY: Must it be brought home and dried?

DR. GAY: It can be put up in shocks outside, if you prefer this way. Hayward told men on our farm the other day that he would never think of using alfalfa so long as he could grow cow pea hay. There is a common theory that legume hay is not good for horses. I was a student at Cornell under the most ardent advocate of this thor. It is claimed that it will produce heaves, but it is question in my mind whether mixed hay has very much to do with the heaves. We do know that in a locality where it is grown, they are troubled with the heaves, but it is necessarily due to the hay. There may be other causes.

So far as alfalfa is concerned, if I could buy alfalfa hay grown in Utah at the same price as timothy hay here, I would use it. It contains three times as much protein, and is almost perfect ration in itself. I buy it nicely put up in bundles at $26.00 in the car. The second lot I got was $29.00 almost the same as timothy hay is costing here, but to my mind it is worth the price, because it is a perfect ration. We have fed this alfalfa to our horses and to our dairy cows, and I don't know of anything that is better than alfalfa, if you get the proper kind.

The Iowa Experiment Station has done some work with cottonseed meal, and they find it more economical to feed 10% cottonseed meal for their range than to feed all corn and alfalfa. As they use it in Iowa, they found they could feed a little over a pound—a pound and a tenth, to be exact—of cottonseed meal, with good results, and very materially save their corn. Linseed meal didn't do so well. It was too much of a laxative. But their experiments seemed to show that cottonseed meal was all right.

MR. GOODERHAM: You can feed up to a pound and four tenths without harm.

MR. COWAN: You don't say anything about wheat.

DR. GAY: That is a coliky thing to feed horses. There is a possibility that alfalfa and clover will cause heaves, but there is no doubt that wheat will cause colic. Of course, wheat has been used, and it has certain value, but it would only be of value where the price is very low as compared with other horse feeds.

The SECRETARY: I have found the whole wheat to be a laxative.

MR. COWAN: I have never tried the whole wheat; we have nothing but the wheat middlings and bran, and I make a mixed feed, the same as with the brewers' grains, and it does very well. I never feed any oats.

PROF. COCHEL: What about silage for horses?

DR. GAY: Prof. Cochel can tell you about that better than I can. We have been feeding it, but I do not advise it, because there is a prejudice against it. Take millet: Prof. Cochel can tell you something about that too. It has been absolutely dropped because one man used it unsuccessfully in North Dakota about ten years ago, and told everybody about it, while the people who have used it without harm haven't said anything about it. Now, the same thing has been said against silage. It has caused the death of a great many horses, and, on the other hand, a great many horses have done well on it. I would like Prof. Cochel to tell us his experience with it.

PROF. COCHEL: We have fed a considerable amount of ensilage, and have done it very successfully with our working horses. We have conducted one experiment in which we fed up to 20 pounds of ensilage a day without injurious results. The silage, however, was sweet and we were very careful not to feed him any more than that. If you are certain it is a good silage and you have a good man feeding it, I see no reason why it should not be fed, but where a careless method of feeding is employed, or where enough is thrown down one day for two or three days, I wouldn't use it.

So far as millet is concerned, when we feed it in such qualities and in such a manner that the horses won't eat the heads of the millet, we have never had any trouble with it.

A Member: I buy the Japanese wheat seed with the heads threshed out.

DR. GAY: Now, gentlemen, it has been a big subject, and I have had time only to give you a rambling talk, but I want to start you thinking how to find a more economical means of production. It is just as important to produce at a low cost as to sell at the highest price. If you can't get a margin on the selling side, you do it at the other end, and reduce the cost of production.

A Member: Doctor, what is your idea as a business proposition to raise mules?

DR. GAY: A very good one, but I wouldn't advise the farmer who doesn't know anything about it to go into the business without a visit to Missouri or Tennessee. There are certain things that will sell a mule, and certain other things that will keep him from being sold, and it is wise to learn beforehand just what these things are. I was in Tennessee last summer, and the mule show I saw there was a revelation to me. It takes a negro to know how to handle mules; the white man somehow does not appreciate the dignity of the mule as the negro does, except, perhaps in Kentucky, where the mule has the same dignity as the horse.

In breeding mules, you have your mare to consider. The theory that any old mare can produce mules is wrong. In the South they use brood mares to produce mules. Then you have to consider your Jack, and see that he is all he should be, because our mule is sold largely on faith. You have to sell the mules as (ringlies?) and they live to be sixty, seventy, eighty or ninety years old. No one really knows how old a mules lives to be, because none is ever known to die.

You can sell an old pair of mules, if they have no unsoundnesses, where you can't sell an old horse. The mule will work where a horse will lie down. Who ever heard of a mule giving up? There are a lot of things to be said in favor of the mule, but some other man probably knows more about it than I do.

DIRECTOR MARTIN: Will you please describe a type of draught horse for us?

DR. GAY: Now about the draught horse: the first thing is the weight. Some men consider 1400 pounds as being a heavy horse, but in Chicago he would not come into the draught class. He must weigh at least fifteen, sixteen, or seventeen hundred and fifty pounds up to 2,350 or 2,400 pounds. If you have been accustomed to a 1,400 pound horse looking big to you, you can hardly conceive what these horses look like. These horses could not go in and out of these doors here.

The outlet for a first-class draught horse is the city and not the farm. People will pay four to six or eight hundred and even up to fifteen hundred dollars for a pair of them, but the farmer can't get enough out of a horse like this to pay such a price for him. His work is in the city, where he has to haul heavy loads over the slippery pavements, and make his way in and out of the crowded streets. He should be low, and have the weight to pull a heavy load, and straight, to the back rib. It is simply a problem in physics. He must be heavy so as to pull a heavy load.

The SECRETARY: The same as a heavy engine.

DR. GAY: Yes; in the first days of railroading, the railroads thought the light engines would be better to pull the heavy loads, but experience taught them their mistake, and they have finally come down to heavy engines.

Second: He must be low down in his legs—short-legged. Many people think the longer a horse is, the longer he can draw. This is not a fact, and for it there is a reason, and a very good physical one. You know your power is greater as it is closer to the ground. Take the handling of a pitchfork or a crow bar, as an example; by getting lower down on the handle, you get a firmer hold, and more power to use it. The horse is built on the same plan, and the lower the centre of gravity is, the more power, and the more speed possible. Then there is another reason: the long legged, long backed animal will have long ribs and be light in the thighs, by the law of co-relation.

Then after being low-set, the horse must be wide. Why? Because you need a wide base for him to stand on. You must increase the base of support to increase the stability of the equilibrium; it is simply a law in physics.

Then he must be deep in the middle; not so deep that he gets into his own way; but the middle is the power plant, where he generates his power, but it must be deep enough for him to generate it.

Then he must be chunky. You want him short in the back because his generator is in his hind legs. You stand on your toes, and you have the same thing. The shorter the distance, the less loss in trans-

mission; the longer the distance the power must be carried, the greater the loss. You take this long-backed horse, and you will find he does not carry his load with the ease of the shorter, more chunky one.

Then you must have a bony frame work that will take on muscle. There must be muscle development in order to have strength. Take the draught horse; it has a muscle like the Poland-China. In order to support this muscle, we must have a good bone; but I think most men are too keen on the bone. You want a hard, clean, flinty bone, one that will not give or crumble under the weight of muscle, even if it does not measure eleven inches around the knee-joint. It is like chuck steak—considerable in the chest; it does not depend so much upon the size of the bone, as on the texture of it.

A Visitor: I am not a member, but may I ask a question? As I understand it, you advocate heavy draught horses because they do not slip on the pavements in the city; also, you advocate a low draught horse, as I understand it. Now, is a fifteen hundred draught horse that stands fifteen hands high better than a horse of the same weight that stands seventeen hands high?

DR. GAY: That is either very high or very low for a fifteen hundred pound horse; but I think the low one would be rather the better

A Visitor: You may be right; but I was raised on a farm, and we always tried to get the horses so that they lifted a long pull, to prevent their sliding. I only want to suggest this, so that it may be thought over.

DR. GAY: You think you would get more lift with a longer leg?

A Visitor: Yes, sir.

DR. GAY: Of course, you can get a horse too much on the Dutchman's order. But you take a pair of mules out in the field, and they can out-pull any horse; take them on the street and they cannot move the load that the horse does. Why? Because the mule is long-legged. He is not as well adapted to move a heavy load as the horse is. You put the mule in a heavy pole wagon on the street, and he is no good, and here is where the work of the horse comes in.

The CHAIRMAN: Anything to come before the convention at this time?

MR. KESTER: I would like the members of the Resolutions Committee to meet me here immediately at the close of this session. The members of the committee are: Messrs. Kester, Menges, Ferguson, George and Gooderham.

The CHAIRMAN: If there is nothing further, we will now stand adjourned until 7.30 this evening.

Wednesday, May 22, 1912, 7.30 P. M.

Mrs. Jean Kane Foulke in the Chair.

MRS. FOULKE: I don't want to take up much time with remarks by the presiding officer, but I wish to say what all the others who have preceded me have said—it is a great pleasure to me to be here. I have been here twice before, and in Bradford county, last winter, so you see that I must like it.

I am not going to talk long, but I want to say a word in reference to the program this evening. With one exception, the speakers are women, and I like it because it represents the woman in the Farmers' Institute. I want to say to you that I believe the work of the women is almost greater than that which the men can do. I say that for several reasons'. In the first place, the men have been at it longer, and I have found that the work among the rural women is really greater, and it is a work that the men have not reached. I want to say to my sister workers here, that I do not think you can put too much interest in you work, when we realise how few workers we have in comparison to the magnitude of the work. In order to do the most good, we must put our whole hearts in it. There are tremendous opportunities before us, and I hope that as time goes on, Mr. Martin will see his way clear to add more women to the force, to increase our efficiency, so that every time a man goes out, to an Institute, there will also be enough women who are strong to go out and do that work, no matter how hard it is, because there is a great field for us.

This evening we are going to have some of the new members of the force. As I understand it, they have been at work in other places, but not in Pennsylvania until this last winter, but they have done such good work that Mr. Martin has selected them to show us older workers how to do things. It gives me great pleasure to introduce to you Miss Burnite.

Miss Burnite spoke as follows:

HOME HYGIENE

By MISS MARY A. BURNITE, New York City.

"The worth of a State," says John Stuart Mills, "is the worth of the individuals composing it"; therefore, we must encourage individual homes, and discourage humanity living in large groups. It destroys individuality. We plead for more and a larger faith in individual men and women; boys and girls.

The Home, the most sacred of all our institutions, marks the beginning and progress of all our civilizations. The Home represents the economic pressure of the woman and the man of her group; that is, each special group has an economic pressure peculiar to itself and the

safest means of securing harmony is by affiliation within a given group. This same pressure, however, is preventing the establishment of our homes on the one hand; and interfering with their proper management on the other.

Home composition is father and mother; but a complete home is a happy family. Home is the institution from which we draw for all phases of society; yet we are just beginning to be willing to subject these home problems to a calm and practical analysis. Our deepest and our most sacred memories are bound up in our homes. Within the past few years, however, there has been a great change in the attitude of the intelligent men and women concerning the problems of home and family; both from a personal and social standpoint. Investigations have been conducted; reports are being given, and earnest discussions entered into, with the result that there are healthful and hopeful evidence of the acceptance of the scientific spirit and methods leading to the proper emphasis where it belongs. Schools are studying the Home, but we need to go further than they do. We want to turn the searchlight into our hearts, and by a calm consideration of the facts, arouse in every young man and young woman a sense of the dignity of our homes. We want to emphasize the enormous social service where the home has rendered the value to our own individual being.

What constitutes a home as a resident? Well, it's a house shaped by our men, architecturally speaking, and it is said the house moulds the lady, and The Lady is one with a high physical courage who ideally begets tenderness for suffering; let no one misunderstand: the term "Lady" is always embraced in that bigger term "Woman."

Legally, the home is "a house with all of the appurtenances belonging thereto." From our domestic view point we must consider the hygiene of the dooryard; hygiene of the house construction; hygiene of our sleeping apartments; hygiene of our kitchen, where the very elements which enter into our bodies and which become a part of our very being are prepared; hygiene of our dining rooms, where there must always be mirth and freedom from care during the partaking of our food; hygiene of our living rooms, where is the place of family gathering for council, prayer, and the social order of things.

What is Hygiene? It is described as the science of perfect health. Hygiene is the science of the perfect co-ordination of all the parts of our organism. Hygiene, in the modern term means cleanness. Cleanness of person, cleanness of clothing, cleanness of surroundings, cleanness of good, cleanness of purpose; soulfulness. "Now if you know these things, happy are ye if ye do them." We are also told, "He that knoweth to do good and doeth it not, to him it is sin." Now knowledge of itself does not make morality, and my bringing you this message for better living, yes, for right living, remains entirely with you to the value in your own homes. "A little learning hath made thee mad," and you know "a little knowledge is a dangerous thing;" all of which signifies that we do not truly *know* until we have made this knowledge a part of our own daily lives. This cleanness of soul is but another way of saying that virtue emanates from within. I want to re-emphasize that this knowledge of cleanness availeth nothing unless it is truly transformed into terms of better living; terms of altered attitude toward life; altered motive power in our living; until

we transform this knowledge into an individual problem that we may guard our homes with nothing less than our whole lives; our whole being.

Hygiene means the preservation and improvement of health. Cleanliness of the individual, cleanliness of the community; cleanliness of the State. Then we have Public Hygiene; Industrial Hygiene; Occupational Hygiene; Moral Hygiene; Sex Hygiene; and all these should be controlled by this great institution, the home. Our homes remind us of the one-celled organisms, like unto which we ourselves are: i. e. the Ameboa; the family by its sons and daughters, divides, each going out and forming homes of their own, and each in turn establishing these homes to be divided and redivided again and again. All this reminds us of the composition of our very own bodies, which we know is a complication and succession of cells; from the lower plants and animal life, we know that each cell divides into two; each two into four; each four into eight; each eight dividing so that we have sixteen, etc.

Through biology and bacteriology we know much about disease and its causes, which is generally established in filth of some form; through these sciences we know that our skin is composed of millions of cells; we call it tissue; we know the bones are of like cells; we know that the blood is a tissue; we know about the various nervous systems and much of their functions; we know the glandular mechanism to the hundred and many of their secretions; we know how our food digests; what foods are best adapted to different constitutions, under different circumstances, in order that perfect health may be attained and maintained; we know much about how our food is burned in the body; that it is burned at a lower temperature than such food outside the body; we know how much food is necessary to maintain life, to be nutritive at different ages and in different climates. All this knowledge is within the province of home, and belongs to the home. Our civilization has brought us many blessings, but it also brought out of the distant past a barbarous contempt for the value of human life. We take greater care of our animals than we do of ourselves. Our chickens sleep in open front houses; our cow-stables have windows which are opened; our children sleep in the smallest room in the house, the windows closed and barred, the door shut and locked, so that no out-of-door air whatever may penetrate through these precious human lungs.

This is principally thoughtlessness. Some one says "the best antidote for heedlessness is thoughtfulness." It certainly is *faith* in something, faith and enthusiasm in something which makes life worth living. Let us make this ideal our own. Human bodies, with all things else affecting the same: let us know *ourselves*. Let us consider our own health and that of our children and make this consideration paramount—above all else.

Our first thought will be for the physical; our second thought will be for the mental; our third thought will be for the moral. *Or,* better still, all are so closely bound together that you can't have any one of the three perfect without affecting all. You cannot have any one of the three out of harmony with *Nature* without likewise affecting all three.

Another division may be made: I, Heredity; II. Environment. Heredity is an uncontrollable environment. Before birth, and the

long infancy of human beings gives an extended period of uncontrollable environment. How it behooves us to guard these periods and all phases of life touching the same—for this generation and generations yet to follow. For all these we are responsible.

Later our environment is of our own making. How are these made? I. By standards and thought. Newton was once asked how he made all of his discoveries. His answer was "By always *thinking* into them." In all ages we have had standards. The Greeks' standard was a physical one; the Romans' standard was intellectuality; the monastic standard was spiritual—a crucifying of the flesh: a crushing out of all things fleshly and supposedly earthly. Then followed the aesthetic standards, and then the athletic standards. Now the higher standard is ours—that of the all-around man and woman the fullness and completeness of the whole being. Nothing short of this must satisfy us.

Our standard of air is out-of-door air. We must have good air. Impure, foul air poisons us as we breathe our own breath; tuberculosis follows, and other diseases. We know we cannot heat foul air; we know a lighted match put in a bottle will go out if the cork is put in the bottle to stop out the air. That flame must have oxygen; so must we have oxygen to insure health and life. We breathe in oxgygen; we breathe out carbon dioxide, a poisonous gas, next in its deadly effects to *marsh gas*. The Hebrew fathers' injunction was "keep your windows open toward Jerusalem," meaning toward the East—the sunshine—so that our homes may be purified by these free and natural elements.

I say it is within the power and province of the home to know the human frame, to know what is best for making a perfect being of the babe—the child. "Knowledge is power" we are told—but only when we exercise that power that is knowledge. Who has the better right to know the child, the father and mother of the child, or the doctor? We all agree that the parents should understand the moral, the mental and the physical of their own child; then why have we commercialized this knowledge?

There are annually in America 650,000 deaths which are believed to be preventable. There are over 113,000 deaths due to infectious disease. Whose right is it to know how to stop this awful ravage of human life? American people are very sympathetic and responsive; they are liberal towards relief from floods and disasters, but we have only pennies and little thought for prevention.

Prevention in its multiple of forms is the underlying and upholding principle of the science of medicine; and all this prevention lies within the province of the home. It lies with us as individuals. We alone are accountable to God for our deeds. Doctors? Yes, always, for the materia medica, yes; nurses to aid, yes; but fathers and mothers to make us strong mentally, morally and physically. "Come let us reason together," with the knowledge that is attainable, is not sickness more or less a crime?

Consider one moment the hygiene of breathing deep, full breaths, inflating the spongy tissue with every inhalation; standing, sitting, walking, all with body erect, chest brown forward, and when sleeping, have a low pillow and give full expanse to the air cells in our bodies. Children are often considered stupid when there is a growth we know as "adenoids" which is clogging the natural air passages.

Parents should know when the condition exists, and not leave it for the now vitally interested teacher to discover after the child has remained at the foot of the class for a year or more. Our so-called *heathen* Hindu sisters can teach *us* mothers about the child's breathing. Her child, when very young, is taught to place its finger on the right nostril and breathe in a full breath, then quickly place finger on the left nostril and breathe out; then repeat, breathing in the left and out the right. This exercise is repeated several times a day and the head and nose kept clear and in perfect coordination.

The hygiene of bathing: The skin needs constant cleanliness; the pores left free and open that the impurities of the body may be thrown off. Hence two baths a week with warm or tepid water is none too much, and even every day is better if the occupation is a violent one. Then we need to keep the system accustomed to shocks; therefore the cold sponge bath; both done quickly each morning, the first thing on arising. Also the brisk, sharp rubbing with a course rough towel. Putting one's skin in a healthy glow is one sure measure to avoid colds. Get into clothes quickly and drink a glass or two of pure cold water, and our bodies will be in condition for a good, hard day's work.

Hygiene of our clothing is next to be considered: *Clean clothes* at least twice a week, because as the body throws off poisons and disease, our clothes absorb these, and our clothes must be recleaned to be able to take up these impurities.

Hygiene of the teeth: These are given us for masticating our food and they deserve only our best care. Careful brushing every night before retiring, and in the morning before eating; tooth powder or ribbon paste used once a day. The toothbrush should be carefully protected from dust and dirt when not in use. We cannot be too careful of the children's teeth. Remember the health of the child depends much upon his teeth..

Hygiene of the hands: There is no excuse for us to eat with dirty hands. Our nails may not be polished as though we just came from a manicure shop, but good hot water and soap with a handbrush, is easily used, and necessary to the health of the whole family. Our hands should be clean when we go to bed.

Hygiene of the feet: How many of us have suffered with sore feet? Partially because we do not take proper care of these pedal extremities; partly because our parents were not careful about adjusting our stockings and our shoes after we were supposed to care for ourselves. Mothers are bound to the custom in caring for feet of infants, but how about the feet of those children after three years of age?

One cardinal principle of every house should be *order*. It is heaven's first law—a good one to put in our heavens here below. This will embrace cleanliness—a good habit. What is habit? "It is ability to do with a minimum of attention." It is a saving of energy The habit of cleanliness is a good one. Keep in mind, however, there is a difference between dirt and clutter. The first one we will not tolerate, and the second we must not keep in our homes. Cleanliness is next to godliness; yea, further, without cleanliness we cannot have godliness.

The second cardinal principle is out-of-door air; its composition is nitrogen and oxygen, principally. Nitrogen—there is a German proverb, which, translated, says, "Without nitrogen there is no life,"

and we know that oxygen is necessary for the maintenance of that life. It is said the body needs five hundred cubic inches of air per minute; this makes three thousand cubic inches of air per hour. When wo do not have out-of-door changing this air constantly, are we getting our quota of the life-giving substance? Out-of-door air and sunshine make healthy human beings.

Herbert Spencer says, "one of the first requisites for success in life is to be a good animal;" and to be a good animal is the basis of national prosperity. There can be no right thinking without a sound body, and there can be no sound body without a sound mind, and no sound mind where there is an unhealthy dis-co-ordination of the parts which make life. Sound is used in the sense of incomplete. Why have we brains if we do not use them?

There is the hygiene of the eyes: Care of towel, using only one's own towel, will lessen much eye trouble in our families.

Hygiene of the ears: One advice I quote, given by an old physician: "Never pick the ears with anything sharper than the point of the elbow."

Hygiene of our food: This leads us to sanitation and bacteriology,—yeasts, molds and bacteria. Time and space are too limited to discuss this subject at length.

Our drinking water, another source for watchfulness. "Eternal vigilance is the only price of safety." Use only individual drinking cups. If you happen to be without one, and need one, let me show you how to fold a piece of paper so as to make one that will answer all practical purposes. The common drinking cup is a source of danger. Never use it under any conditions.

With all, let us keep sweet tempered and in good cheer.

Cheerfulness is nine-tenths of practical wisdom. And then do not forget to smile:

"The thing that goes the farthest towards making life worth while,
That costs the least and does the most, is just a pleasant smile:

The smile that bubbles from the heart that loves its fellow man,
Will drive away the cloud of gloom and coax the sun again.

It's full of worth and goodness too, with manly kindness blent;
It's worth a million dollars and it doesn't cost a cent."

Then we must have sex hygiene: Here is where the home has failed utterly in its value. The home, our greatest educational institution, is fast losing the opportunities, because we home-makers do not know what is our privilege to know—what is our solemn duty to know; and then we must have the willingness to teach our boys and girls the sacredness of the human body.

I appeal for an intelligent reading by every home-maker—by every *to be* home-maker, every father and every mother. I will mention only a few of the many good books that all of us should read: Jane Addams' book, as it appeared in McClure's Magazine, beginning November, 1911; an article by the Bishop of London, as in the Ladies' Home Journal, for May, 1908; Anna Galbriath's "Four Epochs in a Woman's Life; G. Stanley Hall's "Social Problems." All are good beginnings, and will lead you, I am sure, to more advanced reading on this important subject.

Knowledge, let me repeat, does not make virtue or morality unless we make it a part and parcel of our daily living.

While conservation is in the air, let us get into line and conserve our homes and the human beings composing those homes. Conservation is the progressive thought of the hour, so let us be prudent, wise people and work for increased efficiency and prevention of waste of life. Do you know, life insurance statistics proved that every ninth man who applies for insurance is rejected? Just by our not exercising our brains, our knowledge. See the waste!

The material waste in every American home is appalling but that is another subject; and the waste of humanity is more heart-rending.

"Let us be up and doing while it is yet called day."

MR. HOLMAN: I would like to ask the lady a question: Do you ever say anything about window curtains, and flowers on the window sills? I think you would get more fresh air if these things were kept out of the way.

MISS BURNITE: Oh, you must throw the curtain back, and put your flowers in a window with a southern exposure, so as to have them "open toward Jerusalem." This way it will still be possible to have the fresh air.

MR. HOLMAN: Can't we get rid of them altogether, if they go out of style?

MISS BURNITE: Yes; or by changing the style.

MRS. FOULKE: It is very gratifying to me to know that the sort of people Miss Burnite speaks of is not entirely due to mothers' training; other forces enter into their lives, and it is just as well to let some one else take the blame.

We will deviate a little from the regular program for a few minutes, to let Mrs. Ott speak to us. I do not know who she is, or where she comes from, but Mr. Martin wishes her to speak to us. I don't know what she will talk about, but she will now address us.

Mrs. Ott spoke as follows:

ADDRESS BY MRS. CHARLES OTT, Sayre, Pa.

Your President says I will speak to you for a few minutes, so I will not take up much of your time, and I am not going to talk to you about farming, because I know nothing about it. I may learn, though; I hope to buy a farm soon. I am going to talk to you about a woman's education for the women of the farm. It should be a business education, because the woman of the American farm is a business farmer.

It has been said that what the Americans waste and consume amounts to ten million dollars a year, and the spender of this money is the American woman. Now, there you have your problem; where is the normal woman going to get her education from so as to spend this money intelligently? When our good forefathers decided we were to be a democratic people, they decided the women did not know enough

to help rule this democracy, and that it would be better for our own good, and for the good of the men who were going to rule the nation, if we were to have a little more education. Still, there was only one kind of education to give the women, and that was the man's education for a man's work, so all along they have given this woman a man's education. What was the result? Once the door was left open ever so little, this woman pushed it open a little farther and crowded her away into the arts, and some of them into the professions; and, having seen something of the work outside of the home, can you blame these women, after they have had a peep at what is going on in the world, for wanting to go on farther still? But year after year, when a woman went to college and studied chemistry, it was claimed she was figuring to do a man's work. So until within the last thirty years, while she did know silk and fabrics, she didn't know very much medicine, or science. Then it was seen that this woman would take up these studies and apply them, with the result that there has been a one-sided development. Now the time for the reaction has come, and our colleges are beginning to see that if these sciences are taken up and applied to the daily life in the home, there will be just as thorough a mental development, and when this is done, and only then, will you have an all around education for women.

The West has done this, and at the same time kept to the applied sciences as the East has. A few years ago I had occasion to place a young girl in a college, and when I asked the principal if they had a course in Home Economics, she was rather horrified and said "No, Madam; our students come here for higher education." But the change in sentiment is coming. I was perfectly delighted a few weeks ago in talking with one of the professors in one of our larger colleges, and, by the way, he was a Professor of History, to find that they are beginning to give serious thought to it in our larger colleges. They are beginning to realize that it is the education that fits men and women for practical everyday life that counts even more than the applied sciences.

The necessity of getting this form of education for women into our public schools early as possible will have to be realized. Instead of putting it in the higher grades as a part of the finishing course, it will have to be taken up in the lower grades, if it is to reach the very ones who need it most. It will not effect your people of the farms much; your modes of life are fixed; but you can do this; you can bring it before your school boards, and you can stand for what it stands for. It will give a chance to your boy and your girl—for the boys will be given a chance in this new form of education. Too many of our boys and girls have to leave school before reaching the higher grades, to leave this course there. Put it where they can have the benefit of it. Put your energy into it, and your personality into it.

I am interested in Home Economics for the entire State of Pennsylvania. The State Farm car goes over these broad fields from time to time, and tells the men what to do for the bugs and the parasites, when you must plant, and what, and how, and how much to feed your cows and hogs, and of balanced rations for your stock, and how to proceed to get the best results out of your soil, but I never see a thing about how the farmers' wife should milk, or a single word about the

best balanced rations for her boys and girls; never a word about how she can prevent germs and bugs from getting into her house. These things are considered important enough for the Chicago University to send out bulletins on for the benefit of the farmers' wife, so why cannot the State of Pennsylvania take up this subject and give some thought to the farmers' wife and her problems, as well as the the problems of the farmer and his soil and stock? I don't see why there cannot be set aside in this farm car one little corner equipped with the latest labor-saving appliances for the farmers' wife, with some one to tell her how to use them and speak to her of her individual problems, just the same as the men. Give here a course in Home Economics. A woman in one end of the car will take up but little room, and the results will be far-reaching.

I thank you for the privilege of speaking to you this evening.

MRS. FOULKE: I don't altogether agree with Mrs. Ott about that corner of the car. I think the women are being driven into a corner too much as it is; what we want is a whole car attached to that farm train, with a woman lecturer to talk on the subjects that are vital to the farm woman, and I see no reason why this could not be done. The additional expense would be very little, and the good resulting from it would be tremendous.

I am now going to introduce a woman who has been very active in the Rural Progress Association, of which I am a very small member, while she is a high marker; she is the President of the Association. She is going to speak on Rural Progress, and I predict that like Mrs. Ott,, she will have something to say, and will go right home with it. Mrs. Smith will now address us.

Mrs. Smith spoke as follows:

RURAL UPLIFT

By MRS. E. E. SMITH, Pennsdale, Pa.

On March 14th, 15th, 16th, a Country Life Conference was held at Philadelphia. Much of interest and profit to agriculture and farm life was brought out at that conference. The whole question of rural progress was gone into in all its phases. Business conditions in rural districts were talked of, the school, the home, the roads, the church, were all touched upon.

But perhaps the greatest emphasis was laid upon the school as forming the backbone of the rural problem. Farmers have long wondered why it is that the boys and girls have left the farm in such numbers, but it is beginning to be recognized that the sort of education given, points to the city, and not to the farm. A country school might be described as a weak imitation of a city school. The records of our schools show that a strictly classical course, such as the schools have given, leads to city life, and to more or less clerical occupations. The fathers tell sons on the farm "there is no money in farming," and every year the son hears nothing but knocking, as regards the father's

business. The average farmer is a knocker, not a booster, as the common expression goes. It is the city men who recognize in agriculture a profitable business and send their sons by thousands to the Agricultural Colleges, while the farmers are giving their sons a training which fits them for nothing, or fits them to be typewriters and clerks. The only form of education for the rural districts is the agricultural graded and high schools—a school which puts agriculture within walking or riding distance of every boy on every farm—a school which though teaching all the standard branches, gives the boys an outlook toward husbandry, which turns their thoughts early to the wonder and charm of farm life and the sciences which underlie it.

But the farmers say these schools cost too much. Yes, they are not cheap. Cheap and nasty go together, you know. The man who is fitted to be the principal of an Agricultural High School will get a salary of not less than $100 a month. That does not sound much like the paltry $40 a month which you are paying the rural teacher in the one-room rural school. But what does this man do? Well my friends, he will be the best investment you ever made. He will teach your boys, and he will teach you. He will save you hundreds of dollars in teaching your boys how to really practice agriculture. Your boys will raise, under his teaching, 40 bushels of wheat to the acre, and other crops likewise. Your boys won't buy potato fertilizer and wheat fertilizer on the fertilizer company's recommendation, as you have done. They will buy the stuff of which the fertilizers are made, and they will know just what to give your land to raise a given crop. Your boys won't breed Jerseys and Holsteins and God knows what in order to get an original strain of your own concoction. They will breed pure bred animals and follow the laws of science. Your boys will understand drainage questions, and they will recognize a need of drainage when they see it.

Most people are agreed that we should have better country schools. This is shown in one way by the movement of the country people from the farms to the cities to secure better school facilities. In Illinois there are 50,000 fewer people in forty-six of the richest agricultural counties on the farms now than there were ten years ago. To secure better schools some urge that more money should be expended for better buildings and equipment and for trained teachers to give better instruction. This means higher taxes; but the advocates of this claim that increased values of land and products raised on the farms make it easier for the farmer to support his school. Others claim that the home should co-operate more closely with the teachers. This means some time and energy on the part of the parents. Others urge that the school officers take a greater interest in the school. This means also the sacrifice of some time on the part of the busy farmer. Others go to the people themselves and claim that the people should take more interest in the annual school elections. This means that the tax-payer would give two or three hours each year to attend his school election. As it is, the average school election is a farce and men are often elected to the position of director as a joke. And yet, if it were seriously proposed to abolish the office of school director in the several townships and put in a county board to manage the schools in a business-like way, the greatest howl and opposi-

tion would come from those school directors who take no interest whatever in the schools.

No one can get something for nothing. If we are to have better schools, the first thing necessary is to spend more money in a better way, to secure a better school organization; to secure better buildings, with equipment; and to secure State Normal trained teachers who will prove an inspiration to children and a live force in the community life. But teachers cannot spend money to secure training for greater efficiency to render better service, on the low salaries now paid by the farmers. Some school districts began to levy annually two mills thirty years ago, and they haven't changed much since. Nearly all townships are levying a shamefully low amount in proportion to their assessed valuation. It is the commonest thing in Pennsylvania for townships to call for a five mill assessment when they are permitted to call a twenty-five mill assessment for school purposes. Is this your township? Are you paying your school teachers at the rate of $300 per annum when even the day laborers of Philadelphia get $580?

Evidently something must be wrong with country life. The farmer finds country life satisfactory only on the financial side, and not even on that side, in some sections. The best factor in developing country life civilization is the human factor, the man or the woman. Men and women with a wider outlook on life may be developed from the boys and girls now in the country schools. More and better sanitary regulations in the school-room, as well as outside, doing away with the unsanitary, crime-breeding outhouses or privy, will make the physical conditions necessary to produce healthy men and women. Hence great need for more heating and ventilating systems, plenty of pure, fresh water, proper light for study, and abundant opportunity for good, wholesome play during recess and at noon. The average township has ample financial power to make a good sanitary, comfortable building for the children, where 95% of them get their only education, so far as books are concerned. Better physical conditions for school room work are absolutely fundamental in making a better school. A well-equipped building, sanitary in all its appointments, with a well-trained teacher in charge, all located in the country, makes an educational institution hard to beat. This the farmers of this, or any other locality can have, if they will pay the price. There is no other way.

Along with the physical needs are the mental and spiritual needs of the child. So the movement for better pictures on the wall, better color schemes for interior furnishings; in short, school room decoration must go along with school sanitation. Also, the library movement must be encouraged if the next generation of men and women are to be thinking men and women.

But perhaps the greatest value of all to the country child is the teaching of agriculture and home economics in the rural High School. The following is a partial list of what such a school may teach: Nature study, how to know trees, birds, flowers. How pitiful is the ignorance of country children about such things. How many country children know the names of even the commonest flowers, calling Arbutus "May flowers;" and also I have known daffodils and narcis-

sus to go by this name. The school gardens teach the children the habits and needs of plants, as well as tillage and preparation of the soil.

Farm crops: Corn seed selection, clover seed testing; how to know a weed seed from a good seed; the different kinds of cultivation needed for different crops; observation of the root growth of different plants, their fertilizer needs, etc.

Nitrogen gathering crops, such as alfalfa, clover, vetch and soy beans, are studied. Experiments with, and without lime, phosphoric acid, potash and nitrogen, are run; the handling and care of manure; animal husbandry and the theory of silos and ensilage, both for dairy and beef cattle; and besides these things, the chemistry, physics and botany which underlie them all.

Finally, the Agricultural High School provides that most sorely needed thing in every rural district, a social centre where the community may gather together and be instructed and amused. This centre should be the common meeting ground of the Farmers' Club, the Grange, the school, the church, which are all organizations for the betterment of rural life. This centre should be the clubhouse for the farmers' family. It should be the amusement centre for the young people. Here should be the centralized school—a real country school with no less than ten grades. Can a purely rural people afford such ideal, such real education? Better ask can they afford to permit their hungry acres to be half tilled while the city swallows up their young. The boys and girls who are to shape the rural life of tomorrow are in the rural schools today, and will go directly from the school to their life work. So long as these children have poorer school facilities than are given to the children of the town, and so long as the education they receive disregards their past experience and their probable future occupation, so long, indeed, as stress is laid in the school room and in the home, upon the advantages of city life, without teaching them how they can attain to a better life on the farm, the drift toward the city will continue unabated, and the complaint of too few people, and poorly trained people will ever be heard in the rural districts.

MRS. FOULKE: I want to keep you just one moment before I introduce the next speaker. I want to make a suggestion. I learned something from the way the men conduct their meetings. When you want something, you make a suggestion, and not a resolution, so I make a suggestion, and I want you to think it over. I think you should put a woman on the Board of Agriculture.

MR. HOLMAN: I have enjoyed these speeches very much, but I think we are making more progress in the country than these ladies give us credit for. At least the women down our way are. The lady who cooks for me is following Mrs. Scott's recipes, and the other morning she cooked a breakfast for us for four cents. At that rate, we will soon be getting our breakfasts for nothing.

MRS. FOULKE: We will now have the pleasure of listening to Dr. Russell, who will speak to us on "Hygiene and Sanitation in the Public Schools." It gives me pleasure to introduce Dr. Russell.

Dr. Russell spoke as follows:

SANITATION AND HYGIENE IN THE PUBLIC SCHOOLS

By DR. A. L. RUSSELL, Midway, Pa.

I want to emphasize what these ladies have said; they have said what I would not dare to say, what no man would dare say, and yet what is true as gospel. I don't know what your politics are, and I don't care, but I dare not say one word about the way our public schools are conducted today without some one jumps up right away. These ladies have told you a part of the thing, and I am going to tell you some more, although they have left but little for me to say.

Our public schools are the citadels of our nation, but they are not all they should be—to our shame be it said, but it took these noble, pure women to tell you so. If you want to know what the condition in our public schools are today, ask your doctor. He could tell you, but dare not. His lips are sealed. I know it now, but I did not know it twenty years ago; these women know it today, but they did not know it twenty years ago; it is a matter of sex. I could give you instances from my own experience, which I would not dare give you, and I know it is the same in your own section, and in your own town; it is the same in Bradford county as it is anywhere else. But don't ask your preacher; ask your doctor, even though he will tell you what will make your hair grayer than it is now. Doctors have known it for years, but they didn't dare come and tell you, and now you leave it to the women to tell you. I am ashamed of myself.

One of the speakers told us about the girl who drank from the cup from which her fiance' had just drank, when he was ill with tuberculosis, and of the bravado with which she did it, and how she died of it. Now, ladies and gentlemen, the next time you have occasion to use a common drinking cup, wash it out thoroughly, and then drink in this way, without letting the cup touch your lip.

The SECRETARY: I suppose the ability to do that depends somewhat on the length of your lip.

DR. RUSSELL: I'm Irish; are you? I would like for every one in this audience to remember this the next time they have occasion to use a common drinking cup. It is very easy to do.

Now there is another matter, a very important matter, and that is the matter of breathing. There are two types of breathing, the male and the female type, and the nearer the female approaches the abdominal or male type of breathing, the better it will be for her. But it is not right to breathe first through one nostril, and then through the other, as the lady has shown us the foreign people do. That may be all right for foreigners, but it is not for Americans. You want to breathe deeply through both nostrils; breathing properly this way for any material length of time will increase the chest or bust at least four inches.

One of the ladies spoke about the cost of education. I think the people of Pennsylvania have reached the point where they do not care

about the cost of education, so long as they get the proper kind of education. It is the right kind of education that we want, but we have not been getting the right kind of education. Remember that I have all due respect for the authorities in charge of this work; they have not been able to do the work as it should have been done, and with all our short-comings, there is not a state in the Union that has the excellent public school system that we have in Pennsylvania.

Observations made during seventeen years' service as a priest of the suffering, has convinced me that the whole field of hygiene and sanitation, in its relation to the physical, mental and moral nature of the child during its school life, is deserving of a consideration at the hands of parents and educators which it has never yet received. It is amazing when we consider the efforts put forth to equip children with the mental powers which will enable them to wrest a livelihood from the world, that it has never seemed to occur to any one that the child might need to be taught how to live. The teacher can not impart this information, for she has never, herself, been taught, and the rigid county or state curriculum leaves no time for such a minor detail as instruction in the methods of right living. The parents cannot give the instruction, for they have not the knowledge. The pastor cannot fill the need, for *he* knows less about how man should live his physical life than does the average person. The doctor could, of course, for his life's training and experience has fitted him for this sacred duty; but, bless you, are not doctors to make people well *after* they become ill? And so, although the whole world is calling for the physically fit, our children are permitted to acquire their bodily development just as chickens and horses do, and any information of value in teaching them how to live must be self-acquired, and then it is everlastingly too late to be of any practical value to them.

The rational aim of education should be the correct and symmetrical development of the physical, mental and moral nature of the child; and that system of tutelage is deficient which neglects any one of those three attributes of all normal human beings. The relationship between these three is too intimate and too intricate to be dissolved, or to be interfered with by any man-made scheme, and a proper development of each is possible only when the development of one is made to assist and accelerate the development of the others. The desirable goal is a sound mind in a sound body; for a brilliant mind in a deficient body is a sorry spectacle, and a feeble mind in a perfect body is pitiful to contemplate, while a depraved moral sense coupled with a keen mind and a vigorous body makes devils laugh and angels weep.

Because our common school system ignores these facts, it is failing to give the child the advantages to which he is entitled. The State has assumed the responsibility of the care of our children during their school days, and parents have conceded to it that right. Yet it has provided no adequate means for discharging that trust. For who is so utterly ignorant and thoughtless as to claim that the child's future is wisely provided for when only his mental training is comprehended? Our common school of modern times, in its curriculum, customs, discipline and deportment, has been fashioned in ignorance of, and in defiance of the simplest elementary rules of hygiene and sanitation, and it is small wonder that the normal balance established by nature has been disturbed. It is of vastly more importance to the school child that his triune characteristics by symmetrically developed, than it is

that he shall excel in any text-book. It is of vastly more importance to him that he be taught to breathe properly, that he know how to insure for himself an adequate supply of fresh air and pure water, that he appreciates the importance of masticating his food properly, that he learns how to work, and how to sleep, and how to clothe himself hygienically, that he be made competent to guard himself from infections and contagion, than it is for him to be able to bound Patagonia correctly, or to trace the course of Mason's and Dixon's line.

"The building of a perfect body crowned by a perfect brain, is at once the greatest earthly problem and the grandest hope of the race." The morality of clean blood ought to be one of the first lessons, and by every consideration, the very last and most emphatic lesson ever taught in any public school anywhere on earth. The preservation of health is a moral and religious duty. "Life is not merely to live, but to live well."

Not only are the fundamental principles of correct living ignored in our schoolrooms, but every day, in every schoolroom in this land, the commonest mandates of hygiene are audaciously violated, and bodily infirmity, physical deformity, and mental deficiency are recklessly encouraged. The vital force which should be utilized in the production of blood, muscle and nerve, is lavishly expended upon illy advised studies. There is something radically wrong with the mode of conduct of our schools in their actual working upon the health and physique of our children. We send our children to school happy, healthy, blooming and lusty; and the monster hands them back to us with adenoids, incurable catarrh, round shoulders, crumpled chests, distorted spinal columns, sallow cheeks, deficient vision and shattered nervous organizations. Such maladies, and many others, are thrust upon children all over this broad continent by the customs, mode of conduct and environment of our common and high school systems. I have never seen a schoolroom, city or country which was not in some way a positive menace to the health of the children forced to occupy it. And the universal errors of construction are intensified and augmented by the method of discipline, habits of study and mode of recitation now in vogue.

I am not arranging the teachers; I am not accusing the school boards; it is you, the patron, who is guilty of these crimes against your own defenseless children. Your teachers and your school boards remain in this benighted ignorance because *you* have never demanded knowledge or competency when you selected them.

The common country school should be a kindergarten for the farm, and from it the farmer population should be recruited and come forth educated into, and imbued with, the high and noble ideals this nation now so much needs. The country school is of the farmer, for the farmer, and by the farmer, and the farmer cannot shun the responsibility for the condition of things as they are. The curriculum of the common school should lead the child toward a life on the farm, and should fit him for being a good farmer. We want more competent farmers; we have too many poor ones. We have too many mediocre preachers; too many incompetent doctors; too many shyster lawyers; too many alleged business men who have not the mental capacity to run a well-regulated peanut stand. What are your farmers' schools doing for the future generations of farmers? Nothing! The moment the child enters the schoolroom he is educated *away* from all

desires or tendencies toward a farm life. Not a single thing does he learn during his whole common school course which will instill a love of the farm into his withering soul, or which can help him if he is forced to take up that occupation. And when he enters high school it is still worse. Don't shake your head at me that way! Don't say you can't help it! You *can* help it! You don't want your boys to be farmers! You want them to be pastry-faced counter-jumpers at $15 a week—you are training them for it in your public schools. You *can* help it, I say! The farmer pays the taxes which support the common schools in the country; he elects the school board, which selects the teachers. It is all in your own hands, if you care to assume the responsibility.

Our school system of to-day is so diametrically opposed to common sense that it is difficult to suggest a starting point for reform in study, but I might call attention to the most useless branch of all—physiology. What we have, however, is only *alleged* physiology, for it was prepared and concocted, and it is taught, by those who have no physiological knowledge, so that its teachings are of no practical value to anybody. The average human being will be no better because he knows how many bones there are in his body, nor because he knows how many ounces of blood his body contains. What he needs most to know in this line is what to do when he breaks a bone, and how to check the flow of his life's blood when he cuts an artery. The children need to know how to marshal and conserve their physical and spiritual forces so that they may go out into the world and play the part of whole and healthy men and women.

Generations of educators, utterly failing to grasp the import and purpose of the science of physiology, have attempted to mold one of the most difficult branches of the study of medicine into a form suitable to the immature minds of children in the public schools. Naturally the result is a failure. No one who had himself any conception of physiology would ever have made the attempt. After over twenty-five years of teaching of alleged physiology in the public schools, the simplest sanitary truths and principles are unknown or unheeded by the most intelligent members of the community. The lingo taught in the public schools, dignified by the term physiology, was conceived regardless of the child's environment, nature, body, or immortal soul. It does not teach him how to live, and it certainly does not teach him how to die. This outrage is perpetrated and perpetuated in cheerless, barn-like structures, without provision for any adequate supply of fresh air; without the facilities of getting even a clean, decent, drink of water; with arrangements for lighting which seem devised to place the greatest possible strain on the eyes, with heating arrangements which vitiate the air, with unsanitary surroundings, and with no proper adjustment between mental processes and physical activity.

We must conform our teaching of physiology to more rational standards, if we hope to benefit the human race. "The knowledge that a man can use, is the only real knowledge; the only knowledge that has life and growth in it and converts itself into practical power. The rest hangs like dust about the brain, or dries like the rain-drops off the stones." (Froude). Our children need no anatomy and no physiology except what is necessary to enable them to apply the rules of health to their modes of life; all physiological education in excess of

this is *junk*. And, strictly speaking, such knowledge is not physiology at all—it is sanitation and hygiene.

Therefore we insist that the so-called physiological education of the common school pupil should be limited to those practical matters which enable him to ward off pain, prevent sickness, promote physical efficiency and postpone death. No workman is fit for any task unless he is first of all fit in body and mind; and school conditions, as now existing, for six hours a day, for nine months in the year, for ten years of our life, do powerfully and injuriously affect both the mind and the body. This powerful influence should be made to work for good instead of evil. It is working for evil at the present time, and no man with a knowledge of the facts dare deny it.

So that, instead of teaching physiology, which is the science of the organs of the body and of their functions, I would teach hygiene and sanitation, which is the science of health and right living. In place of spending time and energy in teaching a child how its teeth were formed, or how its hair grew, or how its skin was constructed, I would have him learn how to take care of and how to preserve his teeth; how to care for, and how to make his hair luxuriant and beautiful, and how to keep his skin clear, active, and free from disease. I would teach him how to know what ventilation is, and how to secure it. I would teach him the ineffable dangers and filth of the common drinking cup, and how it distributes germs from the ailing to the well. I would teach him the nature of typhoid fever, and have him know that every case of typhoid fever is a *crime,* which he can aid in preventing when he knows how the contagion is transmitted and disseminated. I would have him learn the dangers of the common house fly, and its capacity for spreading disease. I would inform him upon the principles of stratification of soil, and the proper modes of drainage. I would teach him of the germs which go to make up the infection of simple wounds, and how they produce lockjaw (tetanus) and blood poison (septicaemia), and how they should be dressed and cared for to avert these calamities. I would tell them of the nature of scarlet fever, diphtheria, (acute anterior poliomyelitis) infantile paralysis, measles, whooping cough, and how those diseases are carried from the sick to the well. I would give them an idea of the rules of disinfection and quarantine, and how to carry them out to cut short an epidemic. I would teach them the nature of tuberculosis, and how it is transmitted and disseminated, and how the great principle of the use of fresh air is baffling the "great white plague." They should be impressed with the fact that if fresh air is so good for the consumptive and cures him, that fresh air is good for him who has not contracted consumption, and will prevent him from taking it. They should learn how thorough vaccination prevents smallpox, and be taught enough of the statistics of this fact to be able to discuss the matter intelligently with the rabid and fanatical antivaccinationists. I would teach them that absolute cleanliness of body and soul encouraged longevity and made for happiness. I would make good health contagious, instead of disease. This would not be physiology, but it would be a knowledge that would be of practical service to every child every day of its life.

Theologians tell us that "Sin is any want of conformity or transgression of the law of God." But there are sins and sins. There are sins of the body as well as sins of the soul, and both involve inevitable

retribution—sins of the soul in the life to come, sins of the body in the present life. There is such a thing as physical morality, just as surely as there is such a thing as spiritual morality. We teach our children how to conduct their lives in accordance with the precepts of spiritual morality, so that they may not be gross sinners against God, but we ignore the existence of physical morality, and permit our offsprings to become the most heinous of physical sinners.

Just so surely as a moral sin is a crime against God, so is a physical sin a crime against man, and because that physical sin is often committed against our own bodies, it is none the less atrocious. Our God is a God of Nature, and our physical sins are quite as certain to demand retribution in the body as are the spiritual sins to demand retribution in the spirit. Every instance where a preventable disease is found to exist is an instance of the commission of a physical sin.

We can enforce public hygiene by law, if necessary, even at the bayonet's point, but personal and domestic hygiene must be taught, for it can never be enforced by law. And general sanitary improvement in the lives of our citizens, or in the conduct of the home of the nation, must take its origin in an enlightened and public intelligence. There is no other way to formulate an enlightened public intelligence, except by creating a hygienic conscience in the young and growing souls of our children, and this can only be accomplished by appropriate instruction in the public schools.

Patrons, superintendents and school boards are evading the moral responsibility for this physical sin, for it *is* a physical sin to permit the child to grow up ignorant of the methods by which he may take the proper care of his body, and likewise ignorant of the manner of life which tends toward physical rectitude. Conscience is almost wholly a matter of education, and we could develop a physical and sanitary conscience in our children with equal facility, as we develop a moral and spiritual conscience within them.

THE APPLICATION OF THE PRINCIPLES OF HYGIENE

The earliest copy-book, whose admonitory lines our cramped fingers laboriously followed in our primary school days as we kept time with wagging head, should have given us an inkling of prophylaxis. When a doctor says "prophylaxis," he means the warding off of the disease. These copy-books told us that "A stitch in time saves nine," and, "An ounce of prevention is worth a pound of cure." Our teachers never appreciated the golden truths locked in those few words; oh, no! they were teaching us how to write. We children might have got something of real value out of that lesson if our teachers had realized that they had in their charge developing minds and immortal souls, and if they had been competent to discharge the duties of their trust. A few chosen words of instruction and counsel regarding the meaning of those phrases would not, probably, have unduly strained the mental powers of those teachers, but the words were not forthcoming; they were *teaching us how to write.*

An ounce of prevention is worth tons of cure! The quiet, modest physician who prevents the development of disease, is greater than the most skillful and famous physicians the world has ever known. The man who wards off an infection from an innocent, healthy child, is richly deserving of the Hosannas, not only of men, but of angels.

The greatest and most noble victories this world has ever known are not those of the battlefield, with its glory, its thrilling bugles, and its waving flags. No! The sublimest victories ever won by men have been those of sanitation and hygiene, or in other words, prophylaxis; that is, prevention in place of cure. Pasteur will be immortal because he changed an art to a science; The name of Koch will never die because he taught us the baleful power of germs; Reed goes high in the glory line because he swept Cuba free from Yellow Fever; Jenner banished the plague of smallpox from all those who wished to be free; Gorgas changed the reeking quagmire of Panama to a sanitary land of wealth and beauty; Behring has saved his tens of thousands from the horrors of death by diphtheria; Stiles is even now driving out the hook-worm from the Southland; and it was all done by the men who realized and accepted the plain laws of hygiene and sanitation. If you will put teachers in your schools who know the laws of sanitation and hygiene, you can banish parasitic diseases from the earth within a dozen years.

FRESH AIR

Children in school, in common with all mankind, consume three kinds of food: air, water and solid food. Air is the cheapest, the most abundant, the easiest secured, the most important, and the most neglected. We can live without solid food for three weeks, without water for one week, and without air for three minutes. Most of us are rather fastidious about our solid food, and the national government has a Pure Food Bureau maintained under the auspices of the Department of Agriculture, with a cabinet official at its head to guard our interests. But there is no bureau or law to prevent us from bathing in or from drinking the water that has passed over or through the body of another, though most of us would be very loath to use such water if we knew it. However, we seem to have no scruples about breathing the sewage from other persons' lungs and throats, even if we know that they cannot all be healthy. In the winter time we conduct ourselves, our houses, school-houses and churches, as if their purpose was to contain air to keep us warm. It is astounding that humanity has never learned what air is for, but they have not. Air is to breathe, not to wear; it is food, not clothing. You should depend on your garments to keep your body warm. The first consideration is to have the air you breathe as pure as possible for warmth at the price of vitiated air is wicked and vicious.

Most people think it is the oxygen in the air that our bodies most imperatively need. In a certain minor sense this is true, but any old kind of air contains oxygen enough to support life, even that air which has been breathed over and over again. It is the carbon di-oxide in the air which poisons us. When air enters our lungs, it contains but four parts of carbon di-oxide in ten thousand, but when it leaves our lungs it contains 430 parts of carbon di-oxide in 10,000 parts, or more than four hundred times as much poison. The problem of ventilation is not to get air into a room, but to get the carbon dioxide out. Very little excess of carbon dioxide in a room will induce drowsiness, mental dullness, and slight headache. Long continued exposure to such conditions induces pallor, systemic weakness and general ill health. In order that each pupil have enough fresh air to breathe, it is necessary for him to have 3000 cubic feet of fresh air every hour.

space, and the air must be changed five times every hour. To secure this amount of fresh air, he must have 600 cubic feet of air space, and the air must be changed five times every hour. It is a mistake to think that the apparatus must be expensive or elaborate in order that the ventilation be adequate. If you will give me a few elbows of four-inch stove pipe, and tools for making openings through the walls, I can install a perfect system of ventilation in any room at the cost of a few cents. There is no mystery about air currents. Any one who knows anything about hygiene and sanitation can explain them to any school board in a few minutes. Heated air rises; carbon di-oxide is heavier than air, and falls to the floor. Hence make openings for fresh air to get in; heat and moisten the air; make openings for the carbon di-oxide to get out, and provide for circulation, and you have a perfect system of ventilation.

Many townships in the State have a perfect (?) system of ventilation. They know it, because the agent who sold it said it was. The fact of the matter is that the schoolroom has no ventilation at all. The furnace has all the fresh air it needs, and the carbon dioxide the furnace creates has an outlet, and there is a perfect circulation of air about that furnace, but the schoolroom is not ventilated, for there is no provision for air currents. The air the children breathe is vitiated, and loaded with carbon dioxide, for there is no fresh air reaches the part of the room where the children stay. I can bear witness, however, that the furnace is perfectly ventilated; it has all the fresh air it needs, and its carbon dioxide is taken away.

These conditions are not likely to last always? Pennsylvania has already provided, in her new school code, for ample air space for every pupil in all schoolrooms which shall be constructed in the future; she has provided for proper methods of lighting; provisions are made for sanitary surroundings. But, let me call your attention to the fact that this is merely law. It is of absolutely no account unless it is enforced, and it will be your duty, as patrons, to see that its provisions are executed. School Boards will obey it, you say. Will they? They violated the laws of God and Nature before; perhaps they may remain unterrified before this statute.

We will soon try the experiment of compulsory medical examination of children in the public schools. If you, as patrons, support this measure, many of these abuses will be nullified and abolished, and our disgrace in this line will disappear and be forgotten, except where it is manifested in the crippled victims who will live as relics of the barbarism gone before.

But the attempt has not yet been universally made, and if the people resist it as they resisted the attempted compulsory vaccination a few years ago, and the State is as week-kneed as it was then, we will slide back again into our former condition of apathy.

Our new school code is a great stride forward, and it will doubtless do much good, if the people support it. But there are glaring errors in it, which, we will hope, will be remedied by future legislatures. No legal enactment can absolve the parent from his duty, and no law can remove the responsibility from your shoulders. You cannot put a sanitary conscience in a man by law. What do you know about the course of study, or the methods of recitation, in the school your child attends? What about the actual sanitary condition of

the room and its surroundings? You know what the conditions and studies were when you went to school. Do you realize how greatly conditions have been changed? Where is the emphasis laid? Does your experience tell you that your child will be better fitted for life than you were? Is the school better today than it was twenty-five years ago? It ought to be. Yes! But is it?

Who is responsible for the curriculum? You can see the problems which will confront your boy in the future, to some extent. Is he being equipped bodily and mentally to meet them? If not, what are you going to do about it?

Every one of you knows in your heart that the horrible conditions I have detailed are true. They are common talk. What are you going to do about it?

One of the most vicious customs of construction of school buildings is applied to the position of the windows. Almost universally we see the country schoolhouse with a row of windows in each side, with the desks ranged between. Quite commonly the blackboard is in front, or between the windows. Wherever it is placed, great care is taken that the light from two windows will fall upon it, so that the pupils' eyes will be continually subjected to the greatest possible strain. If you have never thought of this, try placing a clock directly, and endeavor to ascertain the time of day at the distance of the average pupil from the blackboard. You will feel the tension of your muscle of accommodation at the first glance, even if you succeed in reading the figures on the dial. Yet your childrens' eyes are subjected to this inhuman strain for ten years of their life.

If blinds are used at all, they roll down from the top, and either aggravate the condition, or shut out part of the light from its best point of entrance. They should, of course, roll up from the bottom, in order to afford protection to the children's eyes. The windows, of course, should be on one side of the room only, or be placed so high that the glare would pass over the childrens' eyes, and the desks should be arranged so that light would come from the child's back and pass over his shoulder to the book or blackboard.

We ridicule the Chinaman who pays his doctor to keep him well, and who rolls his window blinds up from the bottom, and who does everything just the opposite from the way we do it; but the slant-eyed celestial exhibits a sound common sense which we westerners would do well to humbly imitate in these things as in many others.

I might take up the illy-adapted seats, which cramp the chests, hump the shoulders and strain the eyesight. I can name a dozen flagrant abuses common in every schoolroom. But my purpose is not to be a pessimist, or, as our school children now say, a "knocker," but only to make you consider actual conditions and to take steps to remedy them.

The United States has twenty-four and a quarter million pupils in her public schools, and for their education $401,397,747.00 are expended annually. Pennsylvania alone spends $42,647.00 each year in maintaining her schools. We have ninety millions of people. Our orators declaim about such glorious statistics and we applaud.

Let me mention a few statistical facts, of which I am not proud. Out of our ninety million people, twelve million are ill during the year, and two millions die. Deducting the deaths from old age, the most of those remaining could have been prevented. Doctors call

them "unnecessary deaths." There are eight million people now living, who will die of tuberculosis. One hundred and seventy-five thousand died last year of this disease. Yet tuberculosis never occurs under hygenic and sanitary conditions, and when it does assail a victim, hygiene and sanitation will save him, if he subject himself to their rules while the disease is in its incipiency. Tuberculosis is preventable.

There will be over two hundred thousand cases of pneumonia in the United States this winter, and over 50,000 of these patients will die. Yet pneumonia is a preventable disease, and never strikes unless the victim has violated the known laws of hygiene.

The comparatively mild diseases of whooping-cough and measles cause more deaths than the deadliest diseases we have—scarlet fever and diphtheria—yet they are practically preventable.

Every case of typhoid fever is a crime for which some one is responsible, and a knowledge of hygiene and sanitation among the people would enable us to blot the name from our catalogue of diseases, for it would become unknown. It is easily preventable.

There are very few diseases that are not preventable. Hygiene and sanitation will prevent the vast majority of sickness and pain. Is it not a matter of importance that our children should learn the principles and laws of the system which has such beneficent possibilities? But teachers who do not have this knowledge cannot impart it, and teachers will not equip themselves with this information until it is demanded of them.

What can you do, you ask? You can do much. Protest to the Department of Public Instruction against the false physiology taught in our schools, and demand that the curriculum be modified to a rational basis, so that our children may be taught hygiene and sanitation—sense, instead of nonsense. Implore the school board to instruct the teachers to ignore, so far as possible, the physiology now prescribed for the state, and substitute therefore a plain, commonsense teaching of hygiene and sanitation. Any teacher can teach hygiene and sanitation from any competent text book, but no teacher can teach physiology properly unless she is a graduate of a good medical school and has practiced medicine for a number of years.

You can visit your schoolroom, and try to help the teacher devise a means of deflecting the light which is blinding your children by its glare. You can supply your own children with individual cups, and ask the teacher to require all other children to have them, and to prevent any child from dipping his cup into the bucket. Think upon conditions in many schoolrooms today, even where there are a few individual cups. Those who do not have them, use a common cup, and dip it into the bucket, the clean and the unclean, black and white, healthy and diseased, cheerfully depositing the germs and filth from their hands upon the sides and rim of the cup, and then washing it off in the fluid your child must drink.

You could insist upon the school board providing desks which will not crumple up the chests and starve the lungs of the children. You could see that an inexpensive system of ventilation is installed—your doctor will be glad to look at your schoolroom, and instruct you how this should be done. You could take a few flowers in the coming spring, and plant them in the bare and cheerless playground. Oh,

there are a thousand things you can do to mitigate the condition of these poor children, if you only will.

If your cow contracts tuberculosis, or if one of your swine becomes ill, the afflicted member is accorded the attention of a member of the President's cabinet. If your apples develop an imperfection, you can summon, without cost, the vast machinery of this mighty government to your aid. The ailments of trees, and the indispositions of hogs are matters of national importance; the diseases of clams and fish are held to be deserving of the closest study of highly salaried government officials; but when a human being sickens and dies of a preventable disease, there is no visible excitement about Washington, D. C.

This great nation, with such a splendidly developed governmental machine that it can catch a mail sack, dig a Panama Canal, manouvre an army along a whole frontier, or chase a plant louse, and do it all with the same power, grace and dispatch, has no provision for caring for the health of its people. Ohio can dump her sewage into the Mississippi to poison the people of Louisiana; New York can dump her refuse upon Pennsylvania, and the government cannot prevent it. It is a notorious fact that the government cares for a sick hog and ignores a sick citizen.

There is at the present time pending before Congress an act known as the Owen Bill, which provides for a National Department of Health. It is the duty of every good citizen to write to his Senator and Representative in Congress and urge upon him that he vote for and work the passage of the Owen Bill. This action is imperatively needed, for against this bill are arrayed all the fanatical and ignorant sects such as the Christian Scientists, Osteopaths, and backed by the money of the patent medicine and dope distributors, they are putting up a powerful fight against the protection of human life and the health of mankind. Your duty here is as plain as it is in your own school district.

MRS. FOULKE: We are now at the end of the program and will adjourn to meet again tomorrow at 9.30, to which meeting I hope all the ladies will come, as it will be the first meeting at which they have been present.

We will now stand adjourned until tomorrow morning.

Thursday, May 23, 1912, 9.00 A. M.

Mr. A. T. Crittenden in the Chair.

The CHAIRMAN: The meeting will please come to order. Mrs. Foulke said last evening that the Chairman should not have much to say, so I will simply introduce to you the first speaker, Dr. J. D. Detrich, who will talk to us about the "Importance of Field Workers for the Development of Better Methods in Agriculture."

Dr. Detrich spoke as follows:

BETTER METHODS IN AGRICULTURE

By DR. J. D. DETRICH, Chatham, N. Y.

I am here to speak to you on a very familiar subject this morning—the subject of better methods in agriculture. The interest taken in this subject shows how vital it is. All the agricultural agencies are working together for the purpose of devising better methods of work on the farms, and there is no feeling of antagonism between me and these several agencies. There is no feeling of antagonism between me and the agricultural college or other medium of higher education; we are all working along the same line, and toward the same end. I believe the solution of the problem lies in the Experiment Station, however, rather than in the school, because there is a vast chasm between the college, and even between the Experiment Station, and the man on the farm. There is no mistake about it. They do not reach him by personal contact, and the farmer gets these bulletins and he may read them, or he may not. If he does, he reads them during his long winter evenings, when he has little else to do, and then lays them on the shelf, and when the times comes to put them into practice, he has forgotten all about what the bulletin told him, and goes on farming in the same old way that he has followed year after year.

The subject on which I am to speak to you will be taken up by me entirely as it relates to dairy farming. That is a subject on which I am at home, because my experience has been entirely along this line, and I am going to talk to you of my own experience, and not about theory. It was because of the fact that I have worked out my theories, and reduced them to actual and successful practice, that I have accepted this position with the Borden people, having just finished writing a course for the I. C. S. About the time I completed the writing of this course, a representative of the Borden Company came to me and asked me to deliver four lectures for the Company. I told him I would gladly do so if we could arrange the details. Two days afterwards I received a letter from the Treasurer of the Company. He ask me to come to see him and I went. We agreed on the four lectures, I to be allowed to choose my own subject. Then I began to speak to the farmers who furnished the milk to the Borden people. They crowded around me, and the Borden people came from New York to hear what I had to say. The Secretary had a horse and buggy and drove me round to meet many of the farmers.

After I got through with my first lecture, a gentleman of the Borden Company asked me to deliver that same lecture again. I did so. After I got through with my lectures, I received a letter from them, asking me to write a series of articles which they would have published, and requesting that I continue to work for them. I wrote back to them that the bulletins that were already published covered millions of subjects, and there were cartloads of literature already on hand covering every phase of agriculture and they didn't appear to do any good, so I considered it a waste of time and money to try to add anything further to what had already been published, and referred them to the course I had just completed for the I. C. S. Then they wrote

me, asking me to take up field work for them. They decided it was necessary to send a man right into the field, to go out to the farmer in his farm. I told them I was engaged in Institute work in Pennsylvania, but they wrote me to come to New York to meet some of their officers. I went to New York and met some of their higher officers and they told me I had given them a great deal of information and they wanted me to take up field work for them and teach their farmers how to grow and feed dairy crops properly. I told them I would be willing to take up this work for them provided I didn't have to work under Dr. Nevins. They told me there would be no trouble about that. Then the officer of the Borden Company stated his proposition, and I listened to it. After he was through I said, "Now I'll give you my proposition; I will work for you provided I am allowed to do it in my own way. I will take up the work in one county and divide it into four parts, according to the four points of the compass. This will give me a radius of about seven miles each way, north, south, east and west, and give me about a hundred farms to look after, and I will guarantee that in three years' time I will have an average of five cows increase on each of these farms." I wrote out my proposition, and they signed it, and I signed it, the time to be one year. Finally, they concluded to make the time for three years instead of one year. Gentlemen, before that year rolled round, they came to me and said, "We want to make another arrangement; we want you to stay with us." I have now been with them two years the 23rd of last March and the results are beginning to show splendidly.

The Borden people are splendidly fitted up for this kind of work; they have every railroad facility and a factory fitted up for the production of a high quality of milk.

The first thing I did after looking over the ground, was to tell them, "You have switches into the factory; why not utilize them in buying fertilizer and feed and seed for the farmer and make this a distributing point?" The Company was in position to get a better quality and a better price than the average farmer, and I suggested that instead of buying the stuff branded "fertilizer," the Company buy soda and phosphate, and nitrogen, just the raw material, and let the farmer do his own mixing according to the formula which I would give him, and thus be the gainer in quality and in price. They accepted the suggestion, and it has worked out splendidly. We found that for feeding stuffs the farmer was paying five dollars a ton more than we were, and this ratio held good in everything else.

At these factories of the Bordens' they have superintendents, and under them are inspectors who go round from one farm to the other to see that the cows and the stables are kept in proper condition, and the inspector for this district would take me to the different farms, and he told the people that the Borden people were sending me out over the county to show the people how to raise dairy crops. In this way we visited over two hundred farms, and every one of them was ready to receive me with open hands—not always ready to endorse all I said, but they received me very pleasantly. I asked them, "are your pastures good in summer?" "Oh, yes." "How about your cows in the winter; are they dry?" "Oh, yes." "Did you ever try oats and Canada peas?" "No." Or, perhaps, "I have tried them, but they are no good," or, "I have tried them but they don't seem to do

well with me." I told them, "Try it again, and do it in this manner: put just so much fertilizer to the acre; I will show you how to mix them, and if you will follow my instructions I will guarantee your crops."

I don't believe in chance farming. A man has no business to be a farmer if he depends on chance, or on seasons to do his farming. In order to succeed, a man must prepare his soil, use sufficient fertilizer to enrich it and enable it to retain the moisture when the dry season comes, so that the seed can grow and not burn up. I am not advocating anything new. The Agricultural College, the Experiment Station and the Institute lecturers have all told the farmer these things time and again, but do you see what it is? The farmer is not a man who understands reading a book; if he does read it, it confuses him, but if you go to him on his farm and tell him how to do a thing, and when to do it, he begins to understand, and what is the result? His crops are sown intelligently, and they cannot fail to produce properly. A man who takes this position of field worker, must know the soil and the market, and he must be able to go to the farmer and tell him "this soil needs phosphate, and this one needs nitrogen, and this one needs potash." I have done this in my work for the Borden Company, and what has been the result? I didn't make a single failure in the one hundred and fifty-seven farms I superintended last year. Every man who put in his crops as I directed, got a good crop. The man who does not mix them properly, or who puts them in and covers them lightly with a harrow, need not expect results. I like to have a failure occasionally, so that the man who makes it will learn the lesson not to do it again. Too many men go half way about a thing, and then blame everyone and everything but themselves for their failures. It is the practical way of doing a thing, the technique, the only way to do a thing, that can produce results. Time and again a man has plowed with the strap too lose, with his horse not properly hitched, so that one horse works with a brace that is too long, the other that is too short, throwing all the work on one horse. It is like the physician coming into a house. We go out to these men and tell them what to do, but we can't make a success where people go contrary to directions. By the failures they make you can get an insight into people's lives.

You take just one thing at a time; that is the beauty of this work. First, oats and peas. I never talk ensilage until they have mastered oats and peas. Have grain enough to feed your horses, and to sell. The same thing with the hay. On one of these farms that I went to, I found the man just unloading hay. I said "that's very fine hay." He said, "Yes, that's the trouble; your cows like it so well that they eat too much, and there is none left to carry them over winter; and I don't know what to do next year." I asked "Why?" He said, "My seed didn't come up." I said, "Put in another crop." He said, "This is no time to sow grass seed; this is July." I said, "Sow it anyhow." He said, "Why I never heard anything like that; you don't know what you're talking about," and turned again to unloading his hay. I talked to him awhile, and said, "You sow that seed as I tell you, and I'll guarantee your crop." He said, "You talk too much, but," with a very firm look and using an oath, "I'm going to do it just to show you that you're lying." I merely smiled at him, and gave him very explicit directions. I haven't seen the man since, but I learned from

the Veterinary that he got his crop, just as I assured him he would, and is now starting a new field. I am citing this simply to show what a man can do if he is only taught how to do it.

After I had them educated into oats and peas, I began to talk ensilage, and then the silos began to go up. At first there was a strong prejudice against it. One man told me that silo would rot the cows' teeth, ruin her stomach, and cause her tail to drop off, but these prejudices have been very largely overcome. I don't know how many silos are going up this year, but the number is increasing right along. One man last year showed me a field, and asked me "what would you recommend me to put on there?" I told him exactly what to do, and since then I haven't seen him, but he asked the Veterinary, "Where is that old Jew with the whiskers on? He told me so many good things last summer that I want to talk with him again."

In addition to purchasing the seeds and fertilizer the Borden Company spent $18,000 for farm papers to be spread among the farmers. Everything that is possible, is done to bring about better methods in agriculture, and the results are beginning to be apparent, especially at Chatham, even though the soil there is rock, rock, rock, stone, stone, stone. Last Fall one of the officials of the Borden Company came out from New York and looked over the farms under my supervision, and after he had gone over them he said to me, "The Borden Company is very grateful to you." Gentlemen, it is the highest compliment I ever received in my life.

Instead of two, four or six cows on the farm, they are now double, because of the ensilage. When hay is $25 per ton, the farmer can depend on his ensilage, and need not worry about the price of hay. A farmer said to me recently "I depend upon my ensilage and oats and peas, and I don't know what I would do without it. I have sold twenty-five tons of hay, and have fourteen more to sell, at $25." These are some of the results of the field work I have done for the Borden Company.

It is nonsense to talk about the advertised registry of a cow, and it is nonsense to talk about pure-bred stock without feed. The first thing towards a good herd is to teach the farmer to develop his grass, and as he develops that, he will get more milk, and more milk means more money with which to buy more and bettter stock.

When Mr. Martin first wrote me to come and speak to you this morning of my work for the Borden people, I tried to excuse myself, but he wrote me again to come and tell you of this work, which is the reason I am here today.

I can very well see how this movement can be extended so as to benefit the farmer. I can see how the Grange and the Farmer's Club can buy in quantity just as well as the Borden Company can. I can see that through these organizations the farmer can buy his seeds and feed and machinery just as well and just as economically as our farmers can through the Borden Company. Why, some of our farmers paid $2.40 for peas in Albany that we have been selling them for $1.85. We give the farmer the benefit of these prices, and, in addition, we give him the value for his money.

The question comes up, Would it not be too expensive for the State to have a field man out? The College has its "Farmers' Week," and the farmer can go there for a few days and receive instruction in the

proper method of doing things, but even that doesn't reach the individual. The field worker can go out to the farmer, and see his soil, and learn his individual problem, and then tell him just what to do. admit it is more expensive than the other way, but I believe it is the only way to produce results. Take one good man, and let him go to college, and then send him out among the farmers to give them the benefit of his scientific education and experience. The average farmer is not scientific; he doesn't go to college; he is simply a bread and butter farmer. He knows nothing of De Kalb soil and Volutia soil, and we do not tell him that oats and peas is a plant food, or that clover will enrich the soil. We simply say to him "here is the one thing you should know; just do this, and you cannot fail to get results." These men can't go to college, but they must be taught better methods of agriculture than they are now practising. It will take three thousand dollars a year to send a man out in this way. If you take the horse hire and traveling conveniences and board bills into consideration, you will see that it will run into the thousands, to run a hundred farms on that principle, but in a year's time you will find it reaching out wider and wider.

The Borden Company, when I began my field work, asked me to prepare an article every week for a certain farm paper. . I said, "That is wrong, when I have nothing to show. When we get crops, then we will have something to show as an object lesson." They kept after me all summer, but I finally convinced them that I was right. In the fall we had a fine show of crops, and this spring I consented to write for the paper. They now write me that they wish these articles continued under "Farm Reports, Institute and Field Work."

Last fall after the field work was over and I had nothing to do, I looked over the Borden farms. After going over them very thoroughly, I wrote the Company that I thought there should be a general overhauling of the whole concern. They wrote me that they were a little surprised at that, but gave me permission to make any changes I saw fit. I went to the superintendent and told him how I wanted things done. He resigned. Then I went to the men, and told them how I wanted things done; the first one I spoke to said "I won't work for you." "All, right, "I said, " you can quit right now;" "but," he said, "you won't have any one here to milk." I said, "I won't have any trouble in finding some one." The kind of men who leave you are the kind whose place you can always fill. My experience has been that when a man leaves, I can always find a better one to take his place. The first month I showed a profit on the farm, and in the month of March they got a profit of $556 from that herd. I heard a man say, "There is no profit in farming today." There isn't in carelessness and recklessness, but where we have scientific farming reduced to terms which the everyday farmer can understand, it is profitable, and I don't know of anything that is more profitable in the outlook than dairy farming. I know there are men who abuse it, who abuse farming, who abuse the Bordens and who abuse me, just as there are men today who will get two tons of hay to the acre where other men are producing four tons to the acre on land that no one would take to be grass land—all due to the plant food they have put into that soil to hold the moisture.

On this farm of the Borden's, when I went there, there were eighty cows; in a week or so, there will be five hundred head of cattle right on this same farm.

MR. BARNES: On low land, as wet as the season has been this year, would it be safe to prepare the soil to get it in shape for fall seeding?

DR. DETRICH: Drain it, and then prepare it in the regular way, and follow up your crop with another of the same kind. I don't believe in rotation; it comes from a Latin word which means a wheel. Where one crop will grow and succeed, another will do the same. If you put in oats and peas and it is not drained—where do you live?

MR. BARNES: York County—eighteen miles northwest of York.

DR. DETRICH: Then sow clover, timothy, alsike and redcock about the 20th of August in your county, and get your soil in shape, and I will guarantee results if the soil is made rich enough.

A Member: What is your theory about planting oats?

DR. DETRICH: I don't doubt some men will get results by running it in with a loose harrow, but I want a maximum crop. Peas I want to drill in three inches deep; oats only one and a half inches. You can plow the peas in so that you can get them four inches deep, and be well covered. Be sure you get them well covered. By following this rule, I never missed a crop in my life.

I have in my pocket a leaflet, which the Borden Company has issued. They want the Veterinary and me to go out to every meeting where the farmers who produce milk for the Borden Company go, and after we have talked to them, they want the farmer to take this little leaflet home with them. It can only be used in field work, and it is merely a summary of what has been told them, so that they may have it for reference. It is called "The Use of the Silo." We do not use anything in book form; simply this little leaflet. I believe it would be a very good idea for the Institute workers of Pennsylvania to emphasize the principal points of their lectures in the same manner—just a little leaflet of two pages for the farmer to take home and carry in his pocket for reference when the Institute is over. A man told me he had built his silo by following exactly the directions of the leaflet. I saw him afterward, and he told me, "I hoped you would come out to see me so that I could talk to you about it before I began." I told him I had been there, but he wasn't at home. He said he was very sorry he had missed me, but he went right ahead and built his silo according to the directions of the leaflet, and it was all right. He was an Englishman, and had never seen a silo before I came there.

MR. HALL: In growing oats and peas, is it better to put them in a week or ten days apart, or at the same time?

DR. DETRICH: Put them in at the same time.

MR. HALL: How do you sow the grass seed?

DR. DETRICH: With a grass seeder; but you can sow it any way, so long as you get it well covered. You must be sure you get the seed well covered.

MR. HALL: Is it safe to use a harrow?

DR. DETRICH: I would not use a harrow; the only safe time to use a harrow is immediately after plowing.

MR. KESTER: All these things are very interesting, but it is hardly in line with the subject on the program.

The CHAIRMAN: It is strictly in line with it.

A Member: What percentage of the Borden farmers are growing alfalfa?

DR. DETRICH: I don't advocate it one bit. Everybody is advising every farmer to grow alfalfa, but you can't make me believe that alfalfa will grow in poor soil. First, get your soil in shape, and then it is time to talk about alfalfa.

A Member: How do you cover your seed when you sow it?

DR. DETRICH: With a light harrow.

The CHAIRMAN: Mr. Lighty, the next speaker, is unable to be here because of the sickness of his wife, but he has prepared his paper, which will be printed with the proceedings.

Mr. Lighty's paper follows:

THE IMPORTANCE OF FIELD WORKERS FOR THE DEVELOPMENT OF BETTER METHODS IN AGRICULTURE

A DEMAND THAT IS NOT MET

By L. W. LIGHTY.

I have watched the progress of agricultural investigation, information and practice for more than a quarter of a century and I am delighted with the results so far, but I am convinced a new step is imperatively demanded at this time.

The farmers institute movement has accomplished great things in this country. It has spread and made popular scientific agricultural information that but for this work would be absolutely unknown to the masses of farmers. The earnest conscientious institute worker, and there are many of them, collected, studied and applied in a practical way as many of the scientific facts set forth by the various experiment stations of this and other countries as it was possible for him to use on his farm and when he had all this matter well in hand he could go before the farmers and talk about it familiarly and practically. It is one thing to know a fact and quite a different matter to apply it practically and profitably in business.

What is called for now is an extension of this work so as to bring the best and most practical information directly to the farmers field and stable. In my institute experience I find at every point a number of men who have problems that it is difficult or impossible to solve at long range and they insist I go home with them and give the needed assistance. This is all well enough but a man's time and energy is limited. During the last few years I did a limited amount of field work in a private way and during this last year I hung out my shingle as Agricultural Counsellor. This personal experience gives me an idea of the demand for this work as well as a rather clear conception of the requirements of the people who call you to counsel and advise. I find this to be true generally, the farmer is a very busy man and does his reading hurriedly and gets a very hazy idea of what he reads. He is not an expert listener to a lecture and though he hears it all he cannot get the gist of it because he has so little training in this line. I believe there is everything in the farm papers and the institute lectures and the experiment station bulletins that any advisor can give the farmer *only the farmer is unable to organize the ideas and put them into pratice on his farm and in his business and it is the business of the Agricultural Counselor to do this and do it in a way that will accomplish results under existing conditions.*

It is easy to talk about a thing you have prepared yourself to talk about and it is quite a little easier to write about it as I happen to know by experience but when you step on a man's farm and he pays you good money to tell him how to do better, more profitable and successful work on that farm you are up against a proposition where glittering generalities will not go the length of your nose. You know or you don't know and he will soon know too and if you do not know, better make a clean breast of it and say so in the beginning.

The first essential, absolute essential is that your client has faith in you. If you cannot inspire faith in your client your effors will be a failure. Right here we come up against the proposition of finding and securing the services of capable farm counselors and advisers. Let us use caution and not bring a worthy cause into disrepute.

QUALIFICATIONS OF THE FIELD ADVISERS

Our National Congress is wrestling at this time with an appropriation bill to enable the Agricultural Colleges to do some of this sort of work and I hope the bill may pass and the money may be wisely used, but I want to admonish the handlers of this fund to be cautious in the selection of men to do the field work. The farmer is a mighty peculiar man just as is the college man. The college man has his serious suspicions about everybody's abilities unless he has a so called college training and the farmer has his suspicions about every body who has this training. I am talking about the rank and file now, there are exceptions of course. Personally I believe a college training is of inestimable value in this work. I may over estimate it because I do not have it. I have heard some of our foremost business and literary men say it took them years to live down the dependence on so called authority instilled in the lecture and class room and acquired the power of personal initiative so absolutely necessary to a successful career. I do not believe a college training is absolutely necessary for this work but I am convinced *that practical successful experience is absolutely necessary in the Agricultural Counselor or field adviser.*

The man who has not had some years of practical experience in the orchard, the dairy or the market gardening field in a commercial way cannot know the many details that are absolutely essential to success as well as the practical business propositions that must be met from time to time and most assuredly what a man does not know himself he cannot counsel another on. It looks now as though the men qualified for this work could not be found, but no doubt the demand would bring a supply at least the demand would lead men to prepare for the work.

SHOULD PUBLIC MONEY BE APPROPRIATED FOR THIS WORK?

There is considerable money appropriated now to our National Department of Agriculture to make investigations on a large scale for the benefit of agriculture. Public money is appropriated for the use of our experiment stations to do experimental work and also to do some original research work. Money from the public funds is appropriated for institute and extension work.

Why? Because the great majority of intelligent people in this country are convinced that the continued prosperity of the nation depends of the prosperity of the farmers of the nation and it is a self evident and undisputed fact that agriculture is successful in the measure of the general intelligence of the men who are engaged in the vocation. Therefore considerable public money is appropriated to develop improved methods of farm operations and some of the funds are used to get those methods before the farmer. This idea of field work or local demonstration work is simply another form of extension work and a form by which more actual and real practical good can be accomplished then by any method that has been tried to this time. This is my conviction from the little experience I have had.

We are convinced the fertility of our soil should be conserved. We know many soils do not yield maxium crops. We daily hear the cry of the high cost of living. Also the "rural uplift" orator tells us a woeful tale. We are aggravated almost beyond endurance at the fearfully bungling and unskilled methods of marketing our products because of our lack of cooperation.

The field worker has an unlimited task if he is equal to the occasion.

THE VALUE OF FERTILITY

Fertility is fruitfulness, the antomym of the term is aridity. Many millions of acres in northern Africa are so unfruitful that none of the land greedy nations of Europe lay claim to it. In our old maps it was marked Saharah.

In my short life of a half a century have seen nice large farms that were phenomenally fruitful so abused by lack of information of the owners that today they are practically abandoned. I am speaking about farms in York, Adams, and Philadelphia counties. These farms in these rich counties are abandoned because they have been rendered unfruitful because of ignorance of good farm methods. Many farms in this State and all over the country are going the same way for the same reason. You can answer the question for yourselves if it is good policy to make a strong personal effort with state funds to evert the calamity of having thousands of abandoned farms for lack of a little information. It is said 16.000 are listed in New York State. The great speeches by our national leaders on soil conservation have their

value but they never reach the man who must do the actual conserving if it is to be done. You get your field worker next to that man in the field and there show him the correlation of organic matter, moisture, lime, potash and phosphorus to the production of legumes and there in that field demonstrate for all that neighborhood, the indisputable truth of your doctrine and you have done more for that neighborhood then all the great speeches that all the great men can make until doomsday.

HIGH COST OF LIVING

Some of the great authorities tell us it is a serious "muchness" of several articles that causes the high cost of living. Too much gold; too much tariff; too much trusts.

I am not a political economist and will not kick at the authorities but I have my ideas and I sometimes express them. The reason we farmers had to pay the unheard of price of 25 cents a pound for clover seed this Spring was because there was not enough clover seed in the country to reach around and a number of farmers did not get any. The reason the city man has to pay $1.00 a bu. for corn and $1.75 per hundred pounds for hay for his horse is because our cribs and mows are empty and we do in many cases not have enough for ouselves. The reason the city man has to pay 25 cents a pound for beef is because we have to feed dollar corn and $1.75 hay to make the beef and we are not making much. There isn't enough to go around. Now this may be political economy but I know it is true. Let me say here to the wise ones who theorize much also to the other ones who do things that if you would reduce the cost of living you must produce more of the stuff folks live on and you must reduce the cost of production and you must devise some method that is less expensive getting the stuff from the producer to the consumer.

One word to the "rural uplifter." The farmer wants the good things of life as badly as any one I know of. He wants the household conveniences, he wants good roads, he wants the telephone, he wants the automobile, he wants the civic centre with its school, library and art gallery, but the first thing he wants is "the dough." Enable the farmer to handle the forces of nature about him to his advantage and enable him to get his products to the consumer without handing to the middle men 66% of what the consumer pays, in other words enable the farmer to make money in his business as do the men who handle, manipulate and transport his products and he will so quickly have the good things of life as to take away the breath of the "rural uplifter!"

I am not finding fault with any ones efforts, but when I see folks trying to lift themselves over the wall by their boot straps I beg of them to desist.

A FEW INSTANCES OF PERSONAL EXPERIENCE

Several years ago Mr. J. called me in to help locate and plan a silo he was about to construct. Rather incidentally we looked at a field that gave him much trouble in wet seasons. I suggested tile drainage and he was at once interested. I located the ditches and gave instructions for digging, laying the tile, making the outlet and covering the tile. He followed instructions and did the work at small cost. I quote from a letter I have on file from Mr. J. to show the results from a very insignificant beginning:

"I want to thank you for inducing me to put the bottom of the silo level with the surface of the soil and locating it so near the feeding alley, but what I want to tell you about more particularly is the value of those tile drains. I have had no trouble with that field since, either in plowing or cultivating and I am sure I made ten dollars for every dollar I spent draining it. A number of my neighbors are also putting in tiles where the soil is wet and troublesome. The car-loads of drain tile came to our station this Spring."

I could cite a number of instances to illustrate what a little leaven will do for a neighborhood, but one more must suffice. Mr. Y. was thinking about a silo for some time, but there being none in his neighborhood he did not feel like taking the initiative for fear it would not be a success, but wrote to me and later asked me to come to his place. He needed a silo and I persuaded him to erect one, helping him to locate and purchase it. He was highly pleased after using it a season and interested his neighbors so much that five of them put up silos, he taking the agency and this cooperation saved the men a few hundred dollars. Here a little outside help so enlightened a neighborhood that six men are now producing dairy and beef products at a great saving enabling them to make money they could not make without the little item of outside assistance. In this work we meet cases where a reorganization of the entire farm management (or mismanagement) is required down to suggesting one or a few items of change and improvement. It is well for the adviser to remember that it it is very easy to suggest too many or too radical changes and his client cannot carry out the instructions.

THE FIELD ADVISER'S OBJECTIVE POINTS

The good mechanic always has a very definite ideal picture in his mind's eye of the product of his labors before he begins. This same must be true of the field worker, agricultural counselor and demonstrator. You must have objective points and then make it your business to arrive.

The first object should be a more fertile, a more productive, a more fruitful soil. This is the corner-stone of your structure and if badly laid the whole structure will fall and the ruins will be appalling.

The next weapon you want to put into the farmer's hand is the ability for cheaper production. A productive soil is one means, but there are many others as the use of the silo, the intelligent use and care of labor saving machine, correct rotation of crops, adaptability of crops to soils and markets and many other items.

First then we produce as much as we can on a given area and do it at as low a cost as possible. But I will say here most emphatically, valuable as is this part of the work it all amounts to very little unless we can help the farmer to get to the consumer with his products in a more business-like way then he is doing now. So long as it costs from 50 cents to 67 cents and even more to market a dollars worth of products the farmer's business cannot be profitable and he will desert the farm and go to the city in a steady stream as he has been doing for the last quarter of a century. This is a mighty problem and calls loudly for solution and if we cannot help the farmer solve it we had better stop talking and do some thinking for a spell. I am not here to call your attention to its great importance. I will say incidentally

that intelligent cooperation of the farmers will go a great ways in its solution. We will have cooperation discussed by able men at the next session and they will doubtless completely cover the ground, but I am speaking now of field workers, counselors and demonstrators and they are to do, act and accomplish things instead of talking about them. They must convince the farmer that the promoter's cooperation and real co-operation for mutual benefit is vastly different. They must by exercising a true missionary zeal instil into the individuals they come in contact with the true spirit of cooperation. I have no set of fixed formulas for the accomplishment of the desired results, but I believe what other countries can do we can do. Several northern European countries and the continent of Australia has great and forcible lessons for us if we are teachable, which look doubtful at times. In many sections almost every farmer is interested in dairying and in these sections the cow testing associations can be made to bring big financial returns to the farmers and at the same time show the farmer how to cooperate practically and successfully. This is a work of the utmost importance and should certainly not be neglected any longer by the State of Pennsylvania. Milk and its products constitutes very largely the food of babes and invalids and enters largely into the nourishment of all the people. It is of the utmost importanc that this food be produced under the best and most sanitary conditions, but this will never be so until the business be made more remunerative then it is at present. In Denmark, Sweden and several other countries the state is lending its assistance in the initiation of this form of cooperation of the farmers with results so profitable to the farmers as well as the state as to be almost incredible. It is my sincere conviction as a student and dairyman of 25 years experience that our State cannot invest any money to greater advantage than to put efficient workers in the field to organize cow testing associations and so assist the associations that they can do the best work. Money wisely spent for this kind of work will yield 1000% interest annually for the producer, consumer and for the State.

The CHAIRMAN: Is Mr. Willard Young here? It appears he is not, so I will take the liberty of calling on Mr. R. P. Kester to continue this subject.

Mr. Kester spoke as follows:

ADDRESS OF MR. R. P. KESTER

I feel like apologizing to the Chairman and to this Institute for the interjection I made a few minutes ago relative to the pertinence of the inquiries to the subject. I really did not expect to be called upon to speak this morning, and I have nothing whatever to talk about. I do not know that Dr. Detrich has left very much for me to say. From my own experience and observation, I am inclined to believe that there is a very real need for the line of work suggested by this subject and by the new Federal bill now before Congress. I talked the other day with a man who asked me where I was going; I told him I was coming

here, and he wanted to know what was the purpose of the State Board of Agriculture and the Normal Institute, and who paid the expenses. I told him the State paid the expenses; and then he mentioned the fact that this money came out of the taxes paid by the people, and said he didn't think it right for the people to be taxed for the benefit of one set of men and one kind of business. In talking with another man in reference to field work, he made the same objection, and you will find, ladies and gentlemen, that there is some objection on the part of the unthinking people to the help that is being extended to the farmer at the public expense; but I think that a little thought on the part of any one would make them wise to the fact that it is not class legislation, but to meet a growing demand for more food and lower priced food, for the best of the world's things not only by the farmer, but by those for whom the farmer produces, and when we help the farmer we are indirectly helping the consumer to get these things. It is an economic question, not an individual or class question.

That the farmer is not producing more per acre, more eggs from his poultry, more milk from his herd, more potatoes from his ground, is not because the farmer doesn't work hard enough or long enough; he does the best he knows how. Nor is it because our State College and Experiment Station have not done excellent work; but it is because the farmer does not know exactly how to apply what he has heard and has not the time to study it out. It takes some one to interpret it to him, and to go out and show him just what would be the result of these things, and how best to apply them. Whether this should be done at the expense of the public or not, it is something that concerns the public as a whole.

I have had some experience in standing upon the platform and trying to teach men how to do things, and why to do things, and when to do things, and just as soon as I get through some man will come up and ask me how or why. If you can go out into the fields and show him, he will be able to do it as well as you can. For some years I spent some time in teaching, and have some ability as a chalk artist, and I find that things taken in through the eye have a better effect than if they are received through the ear alone. We can get a better impression through the eye, than by argument alone. So I believe better results will be achieved by field work than by simply talking to the farmer from the platform.

A great deal of the legislation that was enacted in Congress this last winter pertained to agriculture. One bill appropriated, I believe, some six hundred thousand dollars for State work, and they are taking it up all over the United States, which shows that the people everywhere are beginning to realize the necessity of this field work.

I realize that the field worker must be something of a diplomat; he must have a wide general knowledge, and must know how to handle men. To the boy who goes to State College and then comes home to help his father to better methods, it is to him that the field worker will be of the greatest benefit. I want you to be sure that while you are talking to the father, you get the ear of the son, and the boy on the farm will be more apt to adopt himself to new methods than the older man. I believe that the people of the country want knowledge and want information, but they want to be sure that the man who is giving it to them can meet the final test. I believe the experiment is

worth trying, and I believe that this institute will reap its best results from the men and women who go out and show the farmer how to do, as well as stand on the platform and tell him how and why.

DIRECTOR MARTIN In looking over the audience, I find that we are honored by the presence of Captain Ainey, the Congressman from this district, from whom we expect a great deal. We shall be pleased to have a word from him. He will please come forward.

Captain Ainey spoke as follows:

ADDRESS BY CAPTAIN AINEY

Ladies and Gentlemen: I feel sure that I have your sympathy in being called before you at this time. I just came into the hall, and was engaged in conversation, when I heard my name mentioned, and some one told me I was called upon to come forward. I understand I am limited to about two minutes and a man can hardly get started in less than five minutes.

A few weeks ago it was my privilege to be down in the City of New York and listen to one of the most eloquent men I have ever heard—Rabbi Wise; he talked of Lincoln, and amused our hearts as he spoke of some of the magnificent characteristics of that man. Incidentally he told a story to illustrate one of his points, and to show the prejudice against the Jew. Patrick was taken very ill with the smallpox, and after a while he became so seriously ill that his wife thought he should have the last rights. "All right,' said Patrick, "send for the Rabbi." His wife said, "The Rabbi? Why not send for our own good Father Moran?" Patrick said, "You would not have our good Father Moran catch the smallpox, would you?

I am not a farmer, and I don't know why I am at this meeting. I didn't come here with the intention of speaking, and now that I am speaking, I am not going to talk mere platitudes. I am not even going to talk from an economic standpoint, although our greatest American forces come from the farm, the sooner our people awake to that fact the sooner some of our great questions will be settled.

There was a time when 96% of our population was on the farm, or in the country, and then was the time when patriotism lifted her head, and men went out and exalted the name of our great country. I believe today that the greatest and best place where noble ideals are formed is in the country; you will find that a larger proportion of our great men come from the rural districts.

The first question that confronts us, is good citizenship, and the first great thought that must impress itself upon us is not merely "What can we get out of this country of ours, but what can we put in it?" With so many unworthy and selfish and grasping around us, this is a vital question to the man of worth and intelligence. I have great confidence in our rural population, but unless our cities, with their large mixed populations begin to realize their responsibilities in this direction, they will begin to go backward. And even in the country, because of the drift of the boys and girls away from the farm, rather than to it, the problem is becoming a serious one.

I am glad to have been here, and to have given these few words of greeting. In my estimation, we are going through the greatest trial now that this country will ever go through. We have changed our conception of things, and it is on the farm that the change of thought first had its inception. There will be a new adjustment of things, and the people will rule in fact, as well as in theory. There is a great bloodless revolution now going on, but the same Power that led our fathers through the wilderness, and through the war against slavery, will lead our faltering steps through this crisis now upon us. I believe in the greatness of the American people, and am convinced that it will emerge untarnished from the crisis through which we are now passing.

The CHAIRMAN: We will now take up the next number on the program, "Use of Dynamite in Farm Operations," with illustrations, by Mr. Willard Young.

Mr. Young spoke as follows:

USE OF DYNAMITE IN FARM OPERATIONS

By WILLIARD YOUNG, Wilmington, Del.

I want to say a few words to you this morning about dynamite. Within the last year or two dynamite has begun to be used for a number of different purposes which are very different from what it was first thought dynamite could be used for.

Dynamite is usually supposed to be a very dangerous substance, something not fit for the ordinary person to use. In a very few words, I expect to show you this morning that dynamite is not nearly so dangerous as is often supposed. There are several other substances fully as dangerous, or even more so, in common use, and very few people think of being afraid of them; take gasoline and coal oil, for instance. Dynamite is not nearly so easily exploded as either of these substances, even through negligence. Dynamite is a solid substance which amplified from eight to ten thousand times, according to the temperature in which it explodes. As originally made, it was dangerous to handle, and a very dangerous material to make properly. Now the manufacturers have learned to make it more carefully and more properly. It is more difficult to explode than it was years ago, and requires a stronger detonator. It requires either a six foot fuse, or an electric detonator, which is exploded with an electric current.

A few years ago the question of using dynamite for subsoil was first spoken of. I said I didn't think there was anything in it. I had been using it for blasting rock and coal, but one of our men had been using it on the soil in the West, and he thought there was something in it. So we began to experiment with it, and in many places we found it to be of very great advantage. I know very little of farming, and I suppose you know better than I do, the value of having the soil broken so as to hold water and keep it at the bottom, where it can be reached easily so as to produce rapid growth and get your fertility for your

soil. We have used it for many years for blasting out stumps and rocks. I am often asked why I do not state exactly how much dynamite to use to a stump, and exactly how to do it, and exactly what the results will be. I have found, in looking up carefully the subject of stump blasting, that it is even more difficult to use it on stumps with economy than it is on rocks and stones. Every kind of a stump is different; the stump growth is always different, and the length and size of the roots has a great deal to do with the amount of dynamite required to blast that stump out of the ground. Dynamite always brings the stump out completely, very cheaply, and it also saves a great deal of time.

I find in most cases where men go out into the country to blast out old stumps, they cannot tell how much dynamite they will need until they have first examined the stump very carefully. Some old stumps are very difficult to blast out without two or more charges of dynamite, especially where there is a tap root. In a Southern Pine stump with a tap root, we always bore right into the root. A 12″ stump usually requires a 1½″ cartride—1½″ x 8″, of 40% dynamite. If the stump is very strong, we may use 60% dynamite. On a 40″ stump we may use three quarters of a pound of 40% dymanite. It is best to be careful in boring your holes for the cartridge, because if you are not careful you are apt to split the log.

Next, boulders: In blasting boulders, it is well to cover your charge of dynamite with mud. The next best way is to get a crow bar and pull your boulder out in that way, and the third and cheapest way, is to drill the boulder anywhere from 12″ to 2′ apart, 30″ deep, and load the hole one half full of dynamite.

After you have your trees and rocks and boulders out, you want your place ditched. We have learned that in many cases a ditch can be dug much better by planting charges of 20% dynamite 18″ to 20″ apart, and a detonator to work them, in the middle of the row; this will carry the effect to both ends. Dynamite carries much quicker in wet ground. In wet ground blasting bore the holes from 6′ to 8′ apart and put a detonator near the holes.

We had planned to have a demonstration on one of the adjoining farms this afternoon, but our dynamite did not come in from Wilkes-Barre. We have, however, secured some dynamite here, but we cannot use it as economically. We will, however, do the the best we can with it.

If you will follow the instructions of our factory, there will be no danger, but if you don't follow them there is danger. With even ordinary precaution the ordinary man may use it as safely as he walks along the street. I have handled it for twenty-five years, and used it in all its forms, without any trouble what ever.

A Member: Is there any trouble from headache caused by the dynamite?

MR. YOUNG: In ordinary cases it is better to wear gloves to avoid this; the nitro-glycerine become warm from the handling, and is absorbed through the pores of the skin; it has a tendency to make the heart beat faster, and forces a little more blood to your head, which gives you the headache. The workmen wear gloves, and have no trouble.

MR. HOLMAN: But if you get it near your face, it will give you the headache?

MR. YOUNG: Yes, if you rub your gloves over your face, it will give you the headache; the 20% is not so likely to do it as the higher grades—the 60%. And if it is warm and soft it is more apt to give you the headache. The glycerine alone would not do it, but the nitrated glycerine will.

I have arranged here to show you a few slides, which will explain things better to have than I can do by talking. It will not take much more of your time, and will give you a better idea of the use of dynamite on the farm.

At this point Mr. Young showed a number of slides, illustrating the use of dynamite.

DIRECTOR MARTIN: We will now stand adjourned for the morning. We will have an early dinner, after which we will catch the train at this point for Mr. Jennings' farm, a few miles out, and witness the demonstration of dynamite, getting back here at about half past one, to take up the afternoon's program.

The CHAIRMAN: The meeting now stands adjourned until this afternoon.

Thursday, May 23, 1912, 2.00 P. M.

Hon A. L. Martin in the Chair.

The CHAIRMAN: The meeting will now please come to order. We have been delayed somewhat in our opening hour by the excellent parade given us to show us something of the agricultural progress in Bradford county.

It was our intention to open the afternoon session with an address by Hon. Edward M. Bigelow, State Highway Commissioner. Is Mr. Bigelow present?

MR. FIRST: I believe he is in town, but he is not in the room.

The CHAIRMAN: Then, in order to save time, we will take up the next number on the program, and Mr. Bigelow will follow. Is the Committee on Co-operation ready to report? This committee consists of Mr. R. P. Kester, Mr. E. P. Dorsett and Mr. Archie Billings.

MR. DORSETT: We are.

The following report was read by Mr. Dorsett:

REPORT OF COMMITTEE ON CO-OPERATION

In submitting this, our first report, we realize that many men of influence in this country have in recent years and months turned their attention to co-operation and have been considering it favorably as a

cure for many of our social, financial and political ills. Our purpose in submitting this report is to ascertain if a common ground could not be found upon which all co-operators and co-operative associations might stand and present a united front to the common enemy. We are within safe bounds when we say, that the sentiment for co-operation in the United States has developed more rapidly within the five years last past than it has during all the previous history of the country, and that this development in the future will be at an ever-increasing accelerated pace.

The great difficulty to its organized advancement in the past as well as in the present has been,

1. That the laws of most states have not been favorable to the progress of true co-operation.

2. That among would-be co-operators there has been no standard definition of what true co-operation means.

3. That co-operators themselves, interested in different working bodies, have never co-operated.

It is the purpose of your Committee in submitting this report, to lay a foundation for an attempt to remedy one or all of these conditions in the future. One fact stands out above all others in the agricultural world, and that fact is that the day of the small, detached, independent, go-it-alone-farmer is over. That he will persist as an individual for many years to come is also true, just as it is true that the more efficient horse has not driven out the ox as a motive power; yet the future is to repeat, unless all signs fail, the story of industrial organization combined in other lines.

The reasons for this revolution are not difficult to determine. Business, outside the field of agriculture, is fast passing into what we know as the "trust" stage; for not only do we find the internal affairs of the business placed upon the basis or maximum efficiency, but we also find that its external affairs, or, if you please, its trade relations are guided by a central directing head. In the place of the thousands of independent manufacturing units of half a century ago, we now have few industrial giants grappling with each other for the mastery of the trade and commerce of the world. The industrially unfit have gone down in the struggle, and in the form of the corporation or the trust, there has emerged a new business body with a more efficient business brain than the small individual firm of old could hope to have.

The cause of this industrial revolution we have not here time to discuss, nor is it pertinent to the present subject, save that we may say that the same economic and social affairs which have been at work for over a century merging together the great factor systems of the world, are today operating resistlessly toward the merging together of the agricultural industry. Whether we like it or not; whether we believe or disallow that such organization will prove the greatest good to the greatest number, the fact of such industrial organization stares us in the face as the one supreme and insistent problem of farm life.

We are not sure that it would be advisable to adopt any of the successful systems of co-operation that might have enabled the European farmers to stand up in a give-and-take battle with the great land owners; but of one thing we are absolutely certain and that is, that we must work out a feasible system of mutual self help,

or our children will find the doors of opportunity closing, and their children will batter in vain at doors already shut.

The abandoned farms of Pennsylvania bear silent testimony that we are not dealing with a theory, but with a condition that should arouse us to prompt and decisive action. The best social life is undoubtedly found in communities of home owners, rather than where the rental, or wage system, of labor obtains. It is evident, therefore, that co-operation is the one solution of the problem facing us. To talk in this day of the dissolution of the trusts is rank folly. You can as readily break down the great business organizations as you can throw back the torrent of Niagara with a spoon.

Somehow, business will organize for the greatest efficiency, will produce at the least possible cost, and you cannot stop the working of that economic law by whistling to the Courts and telling them to make the trusts be good. We realize that before we can secure co-operative effort on a broad scale, that we must immediately overcome some serious drawbacks to the general purpose and plan of the idea. The corporate idea of combination is the idea of force. The small man goes in out of the wet to save his own hide and bank-roll, and he votes his bank-roll against the bigger bank-roll of the other fellow, not as a thing he would do, but as the best thing he can do under the circumstances. Sometimes he stays in the game and sometimes he is frozen out. At all times the largest pocketbook speaks with the voice of authority and a strong point about that system is that the authority is centralized in one, or in a few men, who dominate the business. The weakness of capitalism lies in the selfishness of these dominating factors, and in their tendency to crowd out the small investor, and to take as their own the common property of the many entering the original trust and appropriating to themselves all the profits and savings. To overcome this evil, we recommend that in organizing this co-operative movement, memberships instead of stocks be sold to the co-operators and that the members have but one vote; then man and not money will represent the voting power. We do not lose sight of the fact that farming, like the sister term manufacturing, covers a wide range of separate industries, and that success in co-operative organization will not be attained by wholesale methods of organization seeking to cover the whole field of co-operative effort. Rather should the potato growers, the beef cattle men, the wheat producers, and the horticulturists, organize. There should be separate organizations for each and every distinct line of farm production, and the next problem for our solution, and the one which should engage the attention of this body, is the federation of these various co-operative agents, then to seek a common ground on which to stand and a definition, if you please, of co-operation and that having refined it, we then proceed to work out our definition into practice and into law. We need statutory definition of the term, in order that the legal distinction between the corporate and co-operative institutions may be as definite and clean cut as are their practices. We need not only state laws defining co-operation, but a national law which shall cover the large fields of interstate commerce. We do not believe that the time has yet arrived when we should attempt the more formal union of co-operative societies which time alone, together with experience that shall bring individual and local success, can give. The whole scope of our works, and remember we

are speaking in a direct way of the agricultural field, is too disorganized, too strewn with failures, too experimental, for us, either now or in the immediate future, to attempt the final federation of the various agricultural co-operative societies which will naturally come, but which, to be lasting in its benefits, must come through the demands occasioned by local and individual society success. Organization is the beginning and the end of co-operation. Without it, failure is absolutely certain. Our present task, it seems to us, should be to make our local societies, such as the Grange, Farmers' Clubs, the several Unions and allied Agricultural Associations, co-operative; to build up separate organizations into larger units, and to build no faster than business success warrants.

We do not think we shall be able to apply co-operation, at once, to all lines on industry, no in all communities. The human factor must be recognized in every attempt to unite for action. A clear cut recognition of the limitations imposed upon co-operation by the other great forces in the productive, industrial and distributive fields will do much to avert possible failure, and to prevent a feeling of overconfidence, leading us no faster than industrial conditions warrant. We need to maintain a campaign of education that shall not only standardize the product, but shall bring the co-operator into a better understanding of what the business success of the movement means in an economic and social way. We need to break down the idea of competition between co-operative bodies. We need, above all else, to make sentiment and hard business sense go hand in hand. Then, it seems to us, we shall be on the road toward concrete development of the natural order of things.

True co-operation is built upon the principle that "no man liveth to himself alone." This is evident in many lines of work. Farmers build schoolhouses and allow themselves to be taxed. He encourages the law which compels him to give time and money for better roads. All work, such as this, is a application of the principle that we are dependent upon each other. A farmer protects his own household when he protects his neighbors'. He helps his own children when he helps his neighbor raise the standard of the school. When he withholds his support from a co-operative movement, and yet wants its benefits, he is digging a grave for his own rights and profits. The chief aim of this great movement is not personal gain, but one of general welfare. In other words, if the only motive is personal gain and advantage, and that the only one, the co-operative movement cannot be made a beneficial contribution to farm life. It should make its co-operative spirit, its sense of comradship. It is the satisfaction which man gets by working with his fellows that this movement must hold up and draw farmers to gether. If it is to be of any value, it must be trained in the finer spirit of greater human happiness and a closer comradship.

We have dealth with general principles, rather than with specific detail, because thes general facts need working out and that, with some degree of care, before detailed plans of co-operation can be taken up with more than a hope of success. We choose rather, to present the naked truth, than to pluck a bunch of co-operative posies, and pin them to a movement which at this time, and, particularly at this meeting, needs earnest, critical thought. With this aim in view, we offer the following:

Your Committee recommend that a conference be called representing the co-operative associations, and those interested in furthering organizations of this kind, for the purpose of forming a State and National organization, which shall formulate a plan for furthering this movement:

That this conference should include the Grange, the American Society of Equity, Agricultural State Experiment Stations and Agricultural Colleges, the Pennsylvania Horticultural Association and Livestock Breeders' Association, and that this conference shall be called in conjunction with the State Board meeting in January, 1913.

We further recommend the passage of legislation which shall first define what is co-operative business; second, prohibit the use of the term "co-operation" or "co-operative" by business organizations not falling within such legal definition; and third, provide for the proper organization and registration of such co-operative organizations. We further recommend to this body the consideration of the advisability of the appointment of a permanent executive committee, or the continuance of the present committee, to hold office during such time as another general co-operative conference may be held, and to perform such duties as may devolve upon such committee.

Resolved: That it is the sense of this Committee that the term "Co-operation" and "Co-operative" should rightfully be applied only to such organizations as comply with the following regulations:

1. The limiting of votes to individual members, irrespective of holdings, abolishing the proxy.

2. The limiting of interest on membership to prevailing rates of interest.

3. The return of surplus profits, according to the patronage; also, where practicable, according to the service.

(Signed) R. P. KESTER,
E. P. DORSETT,
ARCHIE BILLINGS.

The CHAIRMAN: We would like to continue this committee for another year. If there is no objection, we will have it so understood that the Committee is to continue for another year.

MR. J. ALDUS HERR: At this time it might be well to make a report of the other Committee.

The CHAIRMAN: Let me inquire, is Mr. Bigelow present at this time? If not, we will take up the report of that Committee.

MR. J. ALDUS HERR: At the last meeting of the State Board of Agriculture there was appointed a Special Committee on Legislation. I have the honor to be chairman of that Committee. At the first session of this meeting we had no report to make, because the members had not gotten together; but since then we considered it not more than right to call a meeting of that committee. Our Secretary will read the report of that meeting.

Dr, Conard, the Secretary of the Special Committee on Legislation read the following report:

REPORT OF THE SPECIAL COMMITTEE ON LEGISLATION

The Committee on Special Legislation appointed by the State Board of Agriculture, has met and beg to make the following report:

That we do most earnestly endorse and urge that prompt and vigilant action be taken by the committee of three, appointed yesterday, in co-operating with like committees from the kindred organizations of the State and agricultural institutions, for the purpose of formulating suggestions and requests to the coming Legislature for funds, and that and suitable apportionment and distribution of said funds may be made to the best interests of agriculture in its many branches. We also solicit for said committee the hearty co-operation of all the agricultural organizations and institutions within the borders of this great Commonwealth.

(Signed) J. ALDUS HERR,
W. E. PERHAM,
M. E. CONARD,
S. C. GEORGE,
I. A. ESCHBACH.

The CHAIRMAN: What action shall be taken?

PROF. MENGES: I move it be adopted.

This motion was duly seconded and carried in the regular way.

The CHAIRMAN: Once more, has Mr. Bigelow come in? It appears he is not here yet, so we will go on with the regular program.

MR. KESTER: Mr. Chairman, I would like to suggest that if any person have any resolutions to offer that they hand them to Prof. Menges, the Secretary of the Committee as early as possible, so that we may have the report ready when it is called for. When will this report be called for Mr. Chairman?

The CHAIRMAN: At this evening's session. Time will not permit us to wait on Mr. Bigelow, so we will take up the next number of the program, a paper by Prof. Menges on "Co-operation of Farmers."

Prof. Menges read the following paper:

BY-LAWS FOR CO-OPERATIVE ASSOCIATIONS

By FRANKLIN MENGES, Ph. D.

This organization shall be known as the Farmers' Producers and Consumers Co-operative Association.

CENTRAL OFFICE

The principle office of this association shall be at York, York county, Pennsylvania.

OBJECT OF THE ASSOCIATION

The objects of this Association are to unify and promote the interests of its members in agricultural, horticultural, manufacturing and commercial pursuits, including the producing, trading in and dealing in goods, wares, implements, chattels, grains, vegetables, fruits and other general products, and in buying, selling, holding and leasing or improving the lands, tenements or buildings, and for the further purpose of promoting social culture, moral reform and intellectual advancement, and bringing about a direct connection and relation for mutual benefit between the producers of farm, manufactured, mining and other products and the consumers of the same.

CAPITAL STOCK

The capital stock of this association shall be variable. Capital to be paid in is $2,000.00.

MEMBERSHIP

All citizens of the community in which this association is located, or a branch thereof, who are in sympathy with its objects and are willing to co-operate with it in the accomplishment of its purposes, and pay annual dues of one dollar per member and own at least one share, and not more than fifty shares, of full paid stock in the association shall become members and shall enjoy all the benefits, privileges and emoluments it confers, together with the right to cast one vote in person, and not by proxy, in all elections of officers, and for the transaction of all other business of the association.

ASSOCIATE MEMBERS

All citizens of a community in which the association is located, or a branch thereof, not desiring to become regular or stockholding members, but who in all other respects are willing to co-operate with it in the accomplishment of its purposes may upon the payment of an entrance fee of one dollar, and thereafter annually a membership fee of one dollar, become Associate Members and shall enjoy all benefits and privileges of the association, except that they shall pay 2½% more than the stockholding members for all purchases whatsoever made for them through the association and all costs for making sales through the association, and in no wise shall they be eligible to vote or hold office in the association.

OFFICERS

The officers of the association shall be a President, Vice-President, Secretary and Treasurer, and a Board of Directors composed of six members. All officers to be eligible to hold office must be stockholders in the association and shall hold office for one year, or until their successors are duly elected and qualified.

ELECTIONS

The officers of the association shall be elected at the first quarterly meeting of the stockholders in each year, to be held at the Central Office of the association, or at the central office of any branch association, on the third Tuesday of January, at which meeting a ma-

jority of the stockholders of the association shall be represented in person and vote in person, as hereinbefore provided, for the election of all officers, and for the transaction of all other business. The other quarterly meetings of the association shall be held on the third Tuesday in April, July and October.

DUTIES OF THE PRESIDENT

The President shall preside at all meetings of the stockholders, and shall call special meeting whenever necessary, or whenever ten per cent of the record stockholders shall request him in a petition duly signed by the required number of stockholders to do so. He shall be ex-officio a member of all committees. He shall sign all vouchers issued by the General Manager, and those authorized by the Board of Directors, and attested by the Secretary of the association, for the payment of all claims of indebtedness incurred in the business transactions of the association. The Vice-President shall preside in the absence of the President and shall in his absence perform the duties of the President as hereinbefore stated.

DUTIES OF THE SECRETARY

He shall be the Secretary of the stockholders and the Board of directors. He shall keep accurate minutes, in books provided for the purpose, of the proceedings of all meetings of the stockholders, as well as the Board of Directors. He shall keep the minutes of both the stockholders and Board of Directors open and accessible for the inspection of all stockholders and associate members. He shall give due notice of all regular and special meetings of stockholders, at least ten days before such meeting, to all stockholders at their record address. He shall after due examination and verification sign all vouchers issued by the General Manager, and the Board of Directors, for the payment of all claims of indebtedness of the association, and perform all other such duties as pertain to his office.

DUTIES OF THE TREASURER

All moneys due the association, whether derived from the sale of stock issued by the association, or from entrance fees, annual dues, or from the sale of all kinds of property whatsoever, real, personal or mixed, made by the Board of Directors or the General Manager of the parent association for it, or its stockholding or association members, or any branch association, its stockholding or associate members, shall be paid into the hands of the Treasurer of the parent association, for which he shall give a legal receipt. All indebtedness of the association, whether dividends on the stock issued by the association, declared by the Board of Directors, or indebtedness incurred in the purchase of all kinds of property whatsoever, real, personal or mixed, made either by the Board of Directors of the General Manager of the parent association for the parent association, its stockholding or associate members, or for a branch association, its stockholding or associate members, shall be paid by the Treasurer upon presentation of proper voucher, except that when such indebtedness is incurred for any branch association, its stockholding or associate members, before paying any such indebtedness the Treasurer shall be reimbursed by the Treasurer or the members of such branch association. The

Treasurer shall keep an accurate account of the outstanding and unissued stock of the association, as well as all moneys paid him by members in membership fees, annual dues, and that derived from the sales and business transactions of the association. He shall deposit all moneys and valuable effects of the association to the credit of the association in depositories designated by the Directors of the Association. He shall so far as necessary keep a separate account with each individual doing business with the parent association. The books of the Treasurer shall be audited quarterly by a committee of two elected by ballot annually by the stockholders at their January meeting. The Treasurer's books shall be open at all times for the inspection of all stockholding and associate members. The Treasurer shall give bond in such amount as the Board of Directors shall require.

BOARD OF DIRECTORS

The Board of Directors shall meet for organization on the first Tuesday after their election, and shall elect a presiding officer either from among themselves, or they may make the President of the stockholders their presiding officer without a vote in the transaction of their business. A majority of the Directors shall be necessary for a quorum to transact business. They shall elect a business manager, who in co-operation with and by the advice of the Directors shall manage the business of the association. He shall be a man of known practical, honest, successful business experience and ability. All purchases or renting of real estate upon which to erect buildings, or real estate with buildings for storerooms, warehouses and equipments for all other storing purposes, and manufacturing plants and other necessary buildings, and for yardage and railroad sidings and other necessary trackage, shall be made for the association by the Board of Directors, with the advice and co-operation of the President of the stockholders. All real estate, buildings, manufacturing plants, storage plants of all kinds whatsoever, railroad sidings, railroad trackage, and all other railroad equipments, and all other equipments whatsoever shall be under the management and control of the Board of Directors for the association. All sales of real estate, buildings, manufacturing plants, storage plants, railroad sidings, railroad trackage, railroad equipment, and all other equipments whatsoever shall be made for the association by the Board of Directors, and their deed, release or receipt shall be sufficient guarantee to title. All contracts for the erection and furnishing of buildings, and the repairing of the same, shall be made by the Board of Directors, with the consent of the President of the stockholders. A true copy of all agreements of options for the purchase or sale of the property above described, also a copy of all contracts for the erection and equipment of buildings as above specified, and for railroad equipment, shall be sent to all stockholders of record for their inspection at least thirty days before the final purchase of such real estate, buildings or equipment, or the final signing of contracts for erecting and equipping buildings. Should ten per cent. of the record stockholders voting as hereinbefore provided petition the President of the stockholders ten days previous to the final purchasing of real estate or buildings, or the final signing of contracts for erecting and equipping buildings, to call a meeting of the stockholders to approve, modify or reject the action of the Board

of Directors he shall do so within ten days after the receipt of such petition. A majority vote of the stockholders present who shall represent at least 66⅔ per cent. of the votable stock of the association shall be necessary to approve, modify or reject the action of the Board of Directors, in which mostly the Board of Directors shall not vote, neither shall their stock be represented. All dividends, not to exceed five per cent., on the stock issued by the association shall be declared by the Board of Directors. The salaries of all officers and employees of the association shall be fixed by the Board of Directors, except their own which shall be a per diem and shall be fixed by the stockholders at their January meeting, voting as hereinbefore provided. All salaries of officers and the per diem of the Directors shall not exceed five per cent. of the total financial business transactions of the association, exclusive of the purchase of sale of real estate, buildings, etc., their construction and repair. The stockholders if not satisfied with the salaries as fixed by the Board of Directors may at an annual meeting by a majority vote, voting as hereinbefore provided, increase or decrease the salaries of any or all officers of the association. Any stockholding member of this association who is directly or indirectly acting as agent or representative of a manufacturing, jobbing, wholesaling and retailing concern, or any combination whatsoever of these, shall not be eligible as members of the Board of Directors.

GENERAL MANAGER

All orders for purchases of machinery of all types whatsoever, of fertilizing materials and mixed fertilizers, seeds of all varieties, farm products of all kinds, animals of all species, raw and manufactured materials, fuel of all kinds, building materials of all kinds, tiling, merchandise of all kinds whatsoever, made by the stockholding or associate members of the parent, or any branch association, shall be filled by the General Manager. The General Manager shall sell to the best advantage for the stockholding and associate members of the parent or any branch association all farm and manufactured products of all kinds whatsoever, raw materials of all kinds, animals of all species, and animal products of all kinds, whenever requested to do so. He shall give invoices of all shipments to all branch association made to them or their members. He shall give a receipt and invoice giving the names, quantities, quality and condition of the products to the one furnishing these and retain a copy for himself, and send a copy to the Secretary of the association. He shall keep in touch with all reliable consuming agencies, especially consumers co-operative associations, for selling what is offered, and with manufacturers and producers for buying what is desired, and shall keep in his office catalogues and price lists on file for the use of the members. All orders filled by him for stockholding and associate members, or branch associations, their stockholding or associate members, shall be paid in cash or its equivalent. The sales made by the General Manager for stockholding and associate members of the parent or any branch association shall be paid within five days after the Treasurer has received the money for the same. The expenses incurred in making these sales shall be deducted before such payment is made. The General Manager shall make all bills payable to the Treasurer, and all vouchers by the Treasurer. The General Manager's records of pur-

chases and sales made for stockholding and associate members shall be open for inspection to all such members.

BRANCH ASSOCIATIONS

Ten or more stockholding members in the parent association, or ten or more individuals who are not stockholders in the parent association, but are willing to co-operate with it in the accomplishment of its purposes, who live within reach of a business or shipping point, who won ton or more full paid shares of stock at $10.00 per share in a local association shall, if their constitution or by-laws do not conflict with these by-laws, be recognized as a branch of the parent association. Each branch association shall be financially responsible for its equipment and for whatever property, real, personal or mixed, that may be necessary for conducting its business. The stockholding and associate members of branch associations shall not assist in any way in paying dividends on the stock of the parent association. All orders drawn on the General Manager for purchases or products as enumerated under "Duties of the General Manager" desired by branch associations, their stockholding and associate members shall be filled by him. All such purchases together with the expenses incurred by the General Manager in the procuring of the same shall be paid in cash or it equivalent, and in no wise shall the parent association be financially responsible for such payments until reimbursed by the branch association or its members. The members of the Board of Directors of all branch associations who are not stockholders in the parent association shall have one vote each in the election of all officers in the parent association, but not in the transaction of any other business. Copies of invoices stating the quantity, quality and conditions of all shipments whatsoever made by any branch association to be sold by the General Manager of the parent association shall be furnished by such branch association for the General Manager and the Secretary of the parent association. Any offers of a higher price or prices for any of the products whatsoever of the quality sold through the General Manager of the parent association and enumerated under his duties, and a lower price of the same quality for those purchased through him and also enumerated under his duties, made by any consuming or producing agency, or any combination of these whatsoever, to any member or members of the parent association, or any branch association, member or members thereof, may be accepted by either or all of them but such purchasing or selling prices shall be at once communicated to the General Manager of the parent association and shall become available for the parent association, its stockholding and associate members, and all branch associations, their stockholding and associate members. The refusal or neglect of any stockholding or associate member in the parent association, or any branch association, its stockholding and associate members, to make such communication to the General Manager of the parent association shall be deemed sufficient reason for the Board of Directors of the parent association to withdraw the priviledge of buying or selling through it by any such member or members, or branch association or associations. This provision shall not be construed to include purchases or sale that may be made locally.

STOCK

The par value of the stock of this association shall be ten dollars a share. All certificates of stock shall be signed by the President and Secretary of the association. The money derived from the sale of stock of the association shall be used for the purchase of real estate, buildings and necessary equipment, and in the case of the association desiring to keep the products enumerated on hand for the benefit of members may by and under the management of the Board of Director use the money derived from the sale of such stock for such purchase.

UNASSOCIATES

All people desiring to buy or sell through the association who are neither stockholding or associate members in the parent or any branch association shall be allowed such discount on purchases and rates for selling as the Board of Directors may determine.

EXPENSES

To all purchases made by the General Manager for the parent association, its stockholdings and associate members, or a branch association, its stockholding and associate members, shall be added all necessary expenses incurred in the procuring of such purchases, and such dividends up to five per cent, as the Board of Directors may declare. With this addition the stockholding members shall receive all purchases at cost, while to all purchases made for associate members two and on-half per cent. shall be added, which may be used if they so desire to purchase stock in the parent association or a branch thereof.

THE TERM OF EXISTENCE OF THIS ASSOCIATION IS THIRTY YEARS

These by-laws may be changed or amended by a majority vote of the stockholders at a regular or special meeting, provided that a notice of the proposed change or amendment shall have been sent by the Secretary to each stockholder of record at least sixty days previous to such meeting.

NAMES OF FIRST MEMBERS AND THE NUMBER OF SHARES OF STOCK

PROF. MENGES: We have a good co-operative law in this State, signed by Gov. Beaver in 1887. It is a little different from the laws of the other states.

The CHAIRMAN: Any remarks relative to this paper?

MR. DORSETT: Do you intend to limit the number of shares?

PROF. MENGES: Yes, sir.

MR. DORSETT: How many?

PROF. MENGES: Fifty.

MR. DORSETT: How many votes?

PROF. MENGES: One vote.

MR. DORSETT: It is seldom we have a law in Pennsylvania that is well spoken of. Does that limit the amount of stock?

PROF. MENGES: Yes, sir; you can only have a thousand dollars' worth of stock in an association; we have limited it to five hundred.

MR. DORSETT: But do you know that under the laws of Pennsylvania, you can have as many votes as you have shares; I don't believe your by-laws will stand the test.

PROF. MENGES: Well, I don't know; I submitted these by-laws to a man who stands very high in office, and he said they would go through. It is under the law of 1887, you know.

A Member: What is the value per share?

PROF. MENGES: Ten dollars.

MR. DORSETT: Well, I am not questioning it, Professor, but I have been informed that a man is entitled to a vote for every share of stock he gets.

PROF. MENGES: Well, that may be; but I believe it depends upon the law under which you incorporate. We were incorporated under the law of 1887, signed by Governor Beaver, and unless that law is unconstitutional, I think our by-laws will stand.

MR. DORSETT: I think it has been decided by the courts that a man is entitled to a vote for every share of stock he owns.

A Member: I know that under the common law of the State a man is entitled to a vote for every share of stock in any corporation, or he can vote cumulativly.

MR. KILLAM: Under the law 1874 you can vote directly, or by proxy, for each share of stock you hold. The law of 1887 is another Act, and I do not know of its having been declared unconstitutional, but the question having been raised, I would say that a man can vote as many shares of stock as he can get a proxy for.

PROF. MENGES: Well, sir, we looked into this thing very carefully, and I consulted a man who stands high enough in office to know. I don't want to consume any time. Mr. Bigelow is here; but I just want to bring a few suggestions before this audience:

You all know just as well as I do that unless the Co-operative Association can buy at rock bottom prices, just the same as other selling agencies are buying—unless we are strong enough to do this, co-operation is doomed. You might just as well make up your minds to that. Now, I have had a little experience. Some time ago I wrote to Washington for the names of the importers of German Potash Salt, but I couldn't get them. But I happened to belong to an organization through which I knew I could get them; it is no secret society; it is the American Chemical Society; I got from them exactly what I wanted. Now, the people of Lancaster and York counties have had a

meeting, and reached this agreement. We represent between fourteen and sixteen hundred farmers. Now, we are all farmers, and we are united in our belief that we should not only be able to buy as cheap as anybody else, but we should buy at rock bottom prices. Now, my friends, I suppose I had better keep my mouth shut, but unless we can get the original package right from the ocean steamer, like the other fellow does, we are doomed again right there.

Now, you know that the self-binder costs approximately fifty dollars to make. I am not condemning the middleman; he is not the centre-wheel; he is only a cog in the system that gets everything that you and I pay over fifty dollars for that self-binder.

MR. FENSTERMAKER: Who gets the difference?

PROF. MENGES: I said I am attacking the system.

Now, Mr. Fenstermaker, you draw your own conclusion. Now, my friends, I want you to tell me if that is good co-operation sales agency that saves the farmer this fifty or seventy-five dollars? If you think so, and you can find such an agency, go into it, and I'll tell you another thing: you should go into it. The salvation of the agricultural interests depends upon it. The commercial system that stands between the producer and the ultimate consumer costs us entirely too much.

Now, we want to find out exactly what the selling agency gets. Well, I'll tell you; in the case of this fifty dollars that I am talking of, he gets exactly two dollars. The fellow who wants a Gearing or a McCormick self-binder is going to pay two dollars extra if he wants it. So far co-operation has done away with the local fellow, but he is the fellow that we need. Outside of that it has not done anything; it is the fellow who does not live in our community that gets by far the largest part of the farmers' fifty or seventy-five dollars, and he is the fellow we must get after. I would like to get the system, not the middleman who makes his few dollars and lives in our community, I would like to get every man and woman in this institute into the co-operative movement. But you take a fellow who wants the McCormick binder, and offer him something just as good, he will pay the forty dollars difference and take the McCormick every time; but it is the fellow in the rut, to whom you can offer some inducement; that is the first thing. I sometimes get a little bit mad at some of the things that are said at Farmers' Institutes and at Normal Institutes about the old farmer back on the farm, because that was where I was raised. I remember from 1880 to 1896, my old father who owned a farm of 130 acres, and had six children whom he tried hard to educate, but wheat was fifty cents a bushel—some of you older men remember that; he was a cattle feeder and realized from six to eight hundred dollars from that; but from that time on until 1903, when he died, and from that day down to this, it is a question whether the other fellow will allow you a margin on your cattle or not. I remember when my old father came into the house, and with tears in his eyes, said, "I want to educate you boys, but, I can't afford it; you will have to do it yourselves." That is what this system has cost me—an education, and the making of better things out there on the farm. I don't know whether you like this or not, but I believe it just as sincerely as that I am standing before you. Now, can you and I afford to sacrifice the

education of our children to the commercial system. That is the question that is before us today. I tell you, you put more money out there on that old farm, and the rest will take care of itself. How is that Mr. Northup? I said the rest will come. You won't have any of that "little old red school house," because people are beginning to look for better things. Now, gentlemen, you know co-operation is the thing. It is one of the possibilities of salvation for the farmer.

DIRECTOR MARTIN: Has Mr. Bigelow, the Road Commissioner, come in? Since he is not present, we will now have a very short period of time to devote to the discussion of some questions relative to the Farmers' Institute work. I notice before me some of the old wheel horses of Farmers' Institute work, men who fifteen years ago and twenty years ago, had their sleeves rolled up, going up and down through the State in this great work for the farmer. We have men who have grown old and gray in the work; and the first man I would like to listen to for a few minutes—longer if we had time—is Mr. Henry Northup of Lackawanna county.

Mr. Northup spoke as follows:

ADDRESS BY HENRY W. NORTHUP

Mr. Chairman, Ladies and Gentlemen: I think I can offer a few remarks to the Farmers' Institute. In the first place, I am acquainted with a man that I think should be discharged for the benefit of the Farmers' Institute. His usefulness is about ended; he has been in the work for about twenty years. That seems a long time, and I know it is a long time. I have been under the Director of Institutes for thirteen years, and I don't feel a bit older today than I did when I went into the work. I have had a good time, and enjoyed it. I was at a Farmers' Institute down in Ulster, and I enjoyed it, but I got into conversation with a farmer who said to me, "aren't you a little old to be connected with the Farmers' Institute?" I said, "Perhaps I am, but I enjoy it." We need active, live men in this work, and for that reason I think I had better step out and make room for a younger man who can do more to improve the Farmers' Institute than I can. I think I had better say this myself than let you say it, because I know you want to. I think I will enjoy it more. Another thing I want to say is, I think I had better quit when I should do so.

I have talked in fifty counties of Pennsylvania, and I have learned as much about it as the people have, anyhow. I have at least learned how to conduct my own business on my own farm.

I think it would be an improvement to the Farmers' Institute to have it open by men that are prompt. You know the Institute lecturer is expected to be there, and he is there, but often the public is not there. They are waiting for the meeting to warm up, and then come in and enjoy it. Now, why not have this thing started right at

the beginning of the Farmers' Institute? It will only take a little work on the part of the County Chairman and his committee of workers. There is a man sitting right here in this meeting who does this, and his first audience is as good as any he has. Now, how does he do it? Simply by getting there himself, and his workers get there, and he starts promptly and keeps things going. Then he got the people interested beforehand, and got them to come out by a little personal work on the part of himself and his workers, and we had a splendid meeting. He left his work to go out and work for the Farmers' Institute, and he made a success of it. No one can make a success without making some sacrifice for it. I can emphasize that point, because I had the management of the Institute work in Lackawanna county for ten years. The Chairman must go out among the farmers and talk up the Institute and urge them to come to the first meeting and get it started up, and when the lecturer gets there at nine o'clock and looks at the audience assembled there, he knows whether it is going to be a success, or not. Every Institute lecturer knows the value of being prompt. When I was a lad and went to school, the boy who was prompt got the best marks and was counted the best scholar. It is the same with the Farmers' Institute.

Now another matter that I think can be improved at the Farmers' Institute: You want to discuss such topics as the farmers of that community are interested in. Suppose you take something they don't care anything about; you won't have a very successful institute, but if you take something that the people want, you will have a successful institute every time. Into one community it is better to send a dairy-man out; another community may want potatoes, and a third, soil and fertilizers; but whatever it is, let the Chairman of the county correspond with the Director of Institutes, and have him send men who can talk on the subjects that interest that particular community. I don't believe there is a man in Pennsylvania who gets as close to all classes of people as the Director of Institutes does. I know of one county where they wanted soil fertilizer, and I was sent out to talk dairying; but I talked soil and fertilizer. The trouble is that too many farmers are like the man who was very close, but had a big farm. He went to church regularly and heard the preacher talk about the power of prayer; so he asked the preacher to come over with him and pray that the Lord would give him a good return from a field that was very poor; the preacher prayed, and then he took him into another field, which was poorer than the first one they had been in; the preacher looked at it, and said, "there has got to be something done besides praying, here; there has got to be some manure."

DIRECTOR MARTIN: Now, my friends, this meeting is open for questions, if you have such, relative to this Institute work. Please present them promptly. Our time is brief, so make your discussions short and to the point.

MRS. FOULKE: I should like to bring up the question of our evening sessions. I don't know how we are going to get away from what is called our "evening audience,"—the people who come for amusement, rather than instruction. We go out as instructors; we don't go out as entertainers or minstrels, but the evening sessions almost put us in that position in a great many cases. The evening

meetings are largely given over to local talent—the boy or girl who can recite, or whistle or sing, or play the piano or violin, and the question of instruction becomes a very secondary one, indeed. I have no doubt you sometimes think I'm a fool, but I am not a fool, and I do not think I am called upon to get up and amuse people. These evening entertainments are all right in their place, but I do not think we should take the State's money for it.

Then there is another thing: I do not think we should talk so much about ourselves, our own personal experiences, unless we have something to back up our assertions. I have heard men talk about following the plow, who know nothing about it. With all the experiments conducted by the State College and Experiment Station to talk about, experiments that have been conducted for thirty years, and shown results, why need we talk our own little two-pence half penny experiences? Let us give them facts, and leave ourselves out of it altogether. We are there to teach, not to talk about ourselves, or tell funny stories, as I have heard too many of our lecturers do.

Then another thing I want to talk about: I think there should be little bit more unselfishness on the part of some of our speakers. You will find some speakers who are scheduled to talk for twenty-five or thirty minutes, take an hour or more, and infringe on the time of the next speaker, in some cases taking all the time allotted to him or her This is wrong. Because you are interested in chickens, or some other particular thing, it is not fair to assume that the entire audience is, and it is encroaching on their time, as well as on the time of the next speaker. Now, if I am scheduled for twenty-five or thirty minutes' time, I am going to get that time, and I believe every woman on the force feels as I do. If we don't do good work, we should not be on the force, and if we do good work, we are entitled to our share of the time when we go to a meeting for the purpose of instructing the audience.

Another thing is the separate meetings for men and women. I am not in favor of it. The woman should know all that is going on about the farm, and the man should know just as much about the kitchen sink and the bringing of the water into the house as she does. I never want to talk to a 'Ladies' Session': I want to talk to a 'Women's Session", and at that session to talk to men and women every time.

MISS BURNITE: I want to emphasize everything Mrs. Foulke has said, and more. My experience has been that when I get the women by themselves in a separate session, I cannot reach them as I do in the open session; and there were places last winter where it was absolutely impossible to hold a separate session. I have been at meetings where the men were more interested than the women. In New Wilmington last winter I had to hold a separate meeting for the women, and I found the men more interested in it than the women were.

Then, in reference to the evening session: I was given last winter, time and time again, twenty minutes at an evening session to discuss Home economics, and they had no time to listen to me because the entire evening was devoted to local talent. Home Economics and Hygiene and Sanitation in the home are too important to be crowded out by amusement.

DIRECTOR MARTIN: I want to say a word just at this particular time. Sometimes necessity is a great primary force, and necessity has compelled me to say that at the next sessions' institutes there will be just three instructors. In going over my list of opportionments for the different counties, I found I had expended this last year by $5,000 more then half of the two years' appropriation. I found further that by allowing just three persons to each meeting—I could keep within my appropriation. So I want to say to the County Chairmen, " Go back and consult with your people, and find out what kind of instruction your people want, and then write to me, and we will make up a list of the people who can talk on these subjects; don't ask for another instructor along these lines, because it will be impossible to grant your request."

A number of good instructors will no doubt be disappointed and I am sorry to cause you any disappointment; it is only necessity that compels the action.

We have been given some good points this afternoon on the matter of promptness, and the manner of the speakers, as well as the chairmen have come in for their share. I hope we will be able to profit by what we have heard.

MRS. FOULKE: Mrs. Smith has asked me to say for her that if the meetings were more widely advertised by means of posters, she believes it would help to bring out a better audience.

MR. J. ALDUS HERR: I would like to say a word about the County Chairman. We get out the programs as well as we can, after consulting with our committees. It is usually pretty full, and then some speaker comes along and talks forty minutes longer than he is on the program for, and the next speaker doesn't get an opportunity to talk at all. I have had just such experiences, and the audience often goes away dissatisfied because they came to hear a certain speaker who is crowded out.

PROF. MENGES: I don't think you have said everything there is to be said, but what you have said is the truth.

MR. JOEL A. HERR: Mr. Chairman, I have a little experience along this line. I believe I have always tried to treat the ladies as courteously as I know how—

PROF. MENGES: That is true.

MR. JOEL A. HERR: Many speeches when they are half an hour long are long enough, but when they are lengthened to an hour they are too long. Many of our ladies have subjects that are entertaining for the evening, but there is not much in them and nothing has been learned when they get through. I am not saying this as any reflection upon the ladies, but what we want is the kind instruction that will make us better housekeepers and better farmers when we get home. We don't want something that will fill up the time, and be forgotten when we get home. Now, the speakers should be selected in time, and know just what they are going to do, and then do it.

So far as the programs are concerned, they should be printed on a little better paper; the paper is so flimsy that it is practically worn out by the time it reaches us; and there should be room for the addition of two or three names. The spaces left now are so small that it is almost impossible to write the names in legibly.

Now about amusement: Some people had better never try to tell a story, because they can't do it. Other people are able to emphasize their teachings by means of a story. Now I don't believe in the story being given first place: what we want is instruction; but if a point can be brought by means of a story, it is all right.

Now as to the speakers. I am glad they are reduced to three. Why, at one institute last winter we had six, and it wasn't our fault, either.

MR. JOEL A. HERR: I would like to criticise another thing. Brother Kahler and I had some little trouble over it. Some times we arrange to take care of the speakers, and they refuse to go to the places assigned them, and go off to a hotel ten or twelve miles away now, what is to be gained by going to a hotel, ten or twelve miles away after the people have arranged to take care of them and have gone to a great deal of trouble? Take one case last winter; the people had gone to a great deal of trouble, and put up stoves in the bedrooms and done everything they knew to make the speakers comfortable, and then the speakers refused to stay but went on to town some miles farther on, to a hotel. These people got the impression that their entertainment was not good enough and they took offense.

DR. CONARD: Just a few words in regard to the story. Personally, I never tell one because I can't. Sometimes it may be all right to tell it simply as a clincher, simply to make your instructions take hold, but some of the stories I have heard some institute speakers tell cannot be too strongly condemned, because I have heard some told that are a disgrace to any institute speaker.

I am glad Director Martin is going to reduce the number of speakers to an institute. I have been at meetings where there were five speakers, who discussed five different subjects—dairymen, poultryman, fertility men, orchardist, and a lady on Home Economics—five distinct and different topics to be discussed and in less than thirty minutes. Now in the last thirty years I have had a great deal of experience in both the institute and the school work.The school has only about two instructors; it has been my privilege to be connected with the dairy end of the school; now we have short talks, and very thorough discussions, and I feel that we can do better work where we don't have to divert the attention of the audience from dairying to poultry or to orcharding, or to something else. I believe we can do more good by taking one or two subjects and discussing them thoroughly than by switching from one subject to another in a short time. The subject is largely a matter of locality, and if the county chairman will give the Director a list of the topics that interest the people of that particular community, he can send the speakers to talk on just those particular topics, and have them thoroughly discussed. The way things have been, we have to leave with the work half done.

Now, as to going away to stay over night, there have been cases where it has been necessary. You must remember that the institute speaker is away from home all the time, and he gets the best he can to

take the place of home, and he has to get something pretty good to be compensated for it. He has been at the command of the audience all day, and if he goes home with them at night, he is likely to be talked to death. They want to sit up late and talk about the subjects that interest them, forgetting that the institute speaker has had day after day of this same kind of work, and is tired out when night comes. I have known the time when I wanted to get just as far away as I could, where I would not be worked to death, and have a few hours to myself. I have seen the time when I have been worked until midnight. I believe that with fewer speakers, properly placed, we can do better work; if two men are assigned to a place, and another man so changed as to meet emergencies, I believe we can do better work than with a larger force.

MR. BARNES: As Chairman of one of the counties in which we hold very successful institutes, I wish to say that I have had trouble in years gone by with speakers who would not stick to their subject, or who would not talk on the subjects as assigned in the bulletin for them; this trouble was with ladies, particularly; one lady, especially, would never speak on the subject for which she was assigned. She had a troublesome temper, and often undertook to tell the women in the audience how they should conduct their household affairs; she carried this to such an extreme that she often offended her audience, and on one occasion, a woman in the audience got up and said to her: "Will you kindly tell us how many children you have?" She said, "I never had a child in my life." This lady is not on the force.

I just want to say a word about advertising the meetings. I believe in keeping in touch with the newspapers from the time the list is made out in June until the meetings are held, and keeping them before the public; when our meetings are held, we often carry with us two reporters from our county town, and we always have good meetings when the weather conditions permit it. Secretary Critchfield says these are some of the best meetings he ever attended. He was at one where we had over five hundred people present. It was simply a little county fair, and we distributed over two hundred dollars in premiums. To make the institutes successful, the support of the people back of the chairman is essential; and I have never had any trouble in getting this support.

MISS THOMAS: Notwithstanding what has been said in favor of the County Chairman, I am inclined to think that there is a good deal of responsibility resting on the county chairman and the committee. I think the program should be made out with reference to the benefits the people of that particular locality will get, and the speakers selected with reference to the subjects that appeal most to them.

Then I must endorse very largely that Mrs. Foulke has said, because I have felt just exactly as she has. I have felt that the institute work has been very decidedly hurt by the tendency toward amusement, and I think she voiced the feeling of the people very largely that they are not willing to pay for the institute workers unless they give the instruction for which they are paid, and if you give that instruction you can't do very much toward entertaining the audience.

I agree heartily with what Mr. Herr has said, and I hope the women of this force will do all that is possible for them to do toward elevating the women on the farm. I feel that we do not, at this present time,

want too much scientific knowledge. This scientific knowledge should be brought to the farm in a very practical way, because they are not sufficiently interested in it to take it up unless it is very practically adapted for them. I think there is a very great field in this direction.

Now, I should like to say just a word in reference to our workers. I am very painfully aware of the inefficiency on the part of some of our workers, and I am likewise aware of the great missionary work that some our instructors are doing these latter deserve our heartiest sympathy and co-operation and when they leave a community, I think the people of that community should feel themselves under a debt of gratitude to them.

MR. KESTER: Last fall, I think it was, I read an article on the work of the Ohio institutes, and it was to the effect that the time was too much taken up by the institute workers themselves, and there was no time left for discussion. Now I think it might be well for the institute speakers to take thirty minutes for his talk, and then allow twenty minutes for discussion of the subject. I consider that institute a failure where the speaker cannot arouse any discussion. The institute that counts for something is the one in which the greatest interest is manifested in the discussion. It don't care how eloquent the speaker may be, or how full of interest his talk is, I have seen people in the audience go to sleep over it unless they can be induced to fire question at him and take some personal part in that institute. Then stop when your time is up; but be sure you arouse interest enough to get up a lively discussion, or your institute will be a failure.

MR. BIDDLE: I would like to offer one suggestion. I know that a good deal of the blame rests upon the Chairman and the local committee, but I believe that the Chairman should take good, live man in each community where the institute is to be held, and have him take it up with the farmers in that locality, because he can get into personal touch with them, and it is the personal work that counts. Then make up your program with reference to the subjects that interest those people, and in having my programs printed, I always put a few questions on it, just as a guide to set them thinking and open the way for discussion. Last year was my first year as a County Chairman, but it worked very well with me.

MR. PEACHEY: I am perfectly aware that our time is limited, and it is hard to choose between the praise and the criticism we have received this afternoon. Now, I don't tell stories unless I want to, but I don't feel that I have lost any time when I see my audience getting sleepy and I tell them a story to keep them awake.

Now, as to the three men, I have advocated that for years, for the benefit of the speaker and the audience. I have advocated it publicly and privately.

A Member: How many women?

MR. PEACHEY: We need the women on the force; I don't like to conduct an institute without women, and I don't blame my lady friends over here if they don't want to talk where there are nothing but women. They put up with their share of the hardships. Last

winter I went with some of the institute ladies to hold a meeting; when we got there, there was no County Chairman in sight, and we went through the town looking for a place to stay. We finally found the hotel to which we had been assigned, and it was hardly a fit place for the ladies to go to. I spoke to the County Chairman about it, and he said, "Well, you can hardly expect to get to a good hotel every day; they get paid for their work." That hotel was as cold as charity. We stayed there on Saturday night because there was nothing else to do, but on Sunday we drove nineteen miles. We went more than a Sabbath day's journey, and I don't know how much we worshipped on the trip. I think that the liveryman didn't worship at all. It was cold, and we nearly froze, but we finly reached our destination, and had a warm room.

What I want to say is, that we should try to get the County Chairman to look at the things from the lecturers' point of view, and the lecturer should try to get the County Chairman's point of view; then things would adjust themselves. I will say this: We have some County Chairmen who are a little too liberal in commenting favorably or unfavorably on the speeches of the men before them, and the speeches of these men failed in their effect. I want to say, though, for my friend Mr. Biddle, that most of our chairmen could get good points by going down to Bedford county. Sometimes things are gotten down to nothing whittled down to a point and then the point broke off, but Mr. Biddle knows how to conduct an institute.

Then I will tell you another thing: The section leader does not have the authority he should have. When the institute managers stand by him—

DIRECTOR MARTIN: Tell us what authority you don't have.

MR. PEACHEY: At a convention of rats, who were watched by a cat, they passed resolutions, and did various other things without results; then one very wise old rat said "Let's put a bell on the cat."

DIRECTOR MARTIN: I want to interrogate you for a moment: When you are sent out with a section, are you not given the very same authority as though I was there myself?

MR. PEACHEY: In certain cases; but you know you don't want to guarantee too much protection. You run up against a County Chairman sometimes.

DIRECTOR MARTIN: I put you there to act as though I was there myself; wherein do you need protection?

MR. PEACHEY: I say it is a difficult matter. You come to a County Chairman and say to him, "It is time for the meeting to begin," and he says, "Yes, but I want to see this fellow and that fellow," and how are you going to get that meeting to order?

DIRECTOR MARTIN: We are getting down to real hard business now. I have always told you leaders of sections that where the County Chairman does not come up to time to take charge of that meeting yourselves. Have I not done that?

MR. KESTER: Yes.

MR. PEACHEY: I have done these things: I have called the meeting to order, but I do say that the man who has charge of a section should have a little more authority; he should have authority to cut out some of the local talent at times. I mean by that help that was brought in for a purpose. I can enumerate instances in Pennsylvania where people were brought in who had to be patted on the back for some reason or other, and the meeting was one long speech of advertisement. I am willing to have local talent, and there are instances where a section leader is glad to have local talent to fall back on; it is an advantage to our institute force. I know of one instance where one of the local talent talked for three quarters of an hour, and I guess he would be talking yet unless I had gone to the County Chairman and insisted that the speech must be stopped. I can tell you the name of the man, the County Chairman and the county. We are getting to the point where we are given the responsibility without the authority to carry it out.

MR. CARD: This discussion has brought out some of the unfortunnate things in institute work. Some of these thinks, we must recognize, can be helped, and some cannot be helped. First of all, take the matter of being crowded out, which has evidently hurt so badly our lady friends. That is one of the things that can be easily remedied. Take one man who is allowed forty-five minutes for his speech, while the next subject is crowded into fifteen. These things should not be, but they are, and they should be remedied. Then the matter of starting in promptly. Often the meeting is called for nine, and doesn't begin until eleven o'clock. The local man may not be there, and yet, I think, we will all agree that local talent is an advantage to an institute. I remember one instance, though, where the local man was to talk ten minutes, and he talked forty-five.

The matter of provision for the speakers was spoken of. I imagine that some of us, perhaps, are getting a little too notional, but there is sometimes cause for complaint. I think Mrs. Foulke will remember one case last winter, where we went into a town; there evidently had been little provision made for our entertainment; but we finally found the hotel to which we had been assigned; we found it hardly a place where a lady could stay, so we left our luggage and went out and found another place. Some of the hotels we find in going up and down the State are well managed; some are not. In one place I was assigned to a hotel where I had spent a night before, and in that night I disposed of twenty-two other inhabitants of the room who had possession before I came there, so I would not stay the second time. But all these things must be expected.

One speaker referred to the necessity of bringing out a discussion. That is sometimes a very hard thing to do. It depends largely upon the community. I have been at places where we could not draw out one single question; and again I have been at others where we got up a very lively discussion. It all depends upon your audience, or your ability to impress them, perhaps.

Now, so far as the matter of the reduction in the force is concerned, three persons are enough. I think that better work can be done with smaller number.

The matter of entertainment: It is a question, often, to choose between the matter of entertainment and instruction at an evening session. Often after the speaker has done his best to instruct the audience, in going home he will hear some one say, "Well, I didn't get much out of what that fellow said," while the entertainer gets the praise, so it sometimes becomes a question as to which is best,—how far the meeting shall be made entertainment, or strictly a matter of instruction.

MR. RICH: I believe we are getting to the point where to have a correct report of the speakers' speech, it is necessary to have a syllabus to hand to the paper; there are so many points touched on that a man's speech necessarily is long sometimes, and it is well to have the principal points covered so that a glance will tell what they are.

PROF. MENGES: There is one subject that was discussed last winter by a Committee that met at State College, and that is the advertising of the Farmers' Institute in the local papers. You know just as well as I do, that in order to get the people interested, it is necessary to get the meeting advertised. Mr. Barnes referred to it. I have made an effort along that line in my own section. I was in my own section last week, and I again took up the matter with the people; they are not here today except Mr. Barnes. I know this: That a wide-awake newspaper in any county will be glad to get reports of the institutes, and publish them all. I have never had one bit of trouble in getting anything, so far as agriculture was concerned, in any of our papers at York. They come after me when I don't want them. Now, how many of our County Chairmen have made any effort to advertise the institutes in their counties? I got into a county last winter, where the papers knew absolutely nothing about there being an institute. That is not the business of the Department; it is the business of the local chairman. And nothing will bring out the people more than that kind of advertising. It is easy to advertise, because the majority of papers will gladly take it, and if you find a paper in your county that is unwilling to publish, cut that paper out. If you stand up for your rights, you will soon get it. I was in a county last winter, where the County Chairman was obliged to pay a dollar for advertising this meeting; he paid it, but I made it my business to go on the platform and ventilate that paper. I don't know, Mr. Martin, whether I had authority to do that, or not, but I did it.

DIRECTOR MARTIN:-You have the authority, but you are entirely responsible for it.

PROF. MENGES: Mr. Peachey referred to a meeting last winter where the local talent consumed the time of the instructors. At one meeting where I was, we had a speaker who was put on the program to talk about fifteen minutes, and talked thirty. I thought fifteen minutes was long enough, and I said "Mr. Chairman, this is not a chestnut tree; it is a Farmers' Institute.

MR. BARNITZ: Do you think the newspapers should expect us to hand over a long report of our institutes?

PROF. MENGES: No; I think we should talk to a reporter, and get the reporter to come to that institute.

MR. BARNITZ: You told us last winter that our speeches would be published; that there would be a reporter there to take them down; after the meeting he came to me and said "Where is your speech?" I told him I had none; he then told me to give him a report of it, and he would take it down. Now, we fellows are kept busy writing to our wives, and it is hardly required of us to write our speeches for the reporters.

PROF. MENGES: Let me explain what happened. These reports went to the Secretary of our paper, and they were not published. It took a long time to get anything from you. And there is another thing I want to say; I tell stories myself but they are the right kind. I was at a place last winter where they began "knocking" the institute speakers, and I made up my mind that if there was any "knocking" out to be done, there would have to be some pretty hard "knocking." I don't believe I can be accused of cowardice, and I talked pretty plain to those people, and in order to clinch it, I told a story. I want to tell you that sometimes a story has its effect. The one I told had, I think. It referred to Lincoln. Nearly all the members of his cabinet had been candidates for the presidency at the same time he was—Cameron, Chase, Seward, Wells, and I forgot the other fellow's name; and when they were chosen as his cabinet, they began to think they were the President; his friends urged him to discharge them, but he told them a story: He said, "I knew a farmer out in Illinois who was troubled with skunks; his wife begged him to kill them; they came around at night, and they bothered her. So he took his old rifle and went out to watch the skunk. By and by the skunk came and he blazed away, and pretty soon he came into the house; his wife asked, "did you get the skunk?" He said, "Instead of one skunk their were seven and if the one I got can raise such terrible smell, I think I had better let the others go.

MRS. FOULKE: Just a moment; I want to correct myself. I am glad to have brought out this discussion, which is what I want done But when I referred to the first speaker crowding out the one who was following him, I was not talking for myself, nor, in fact, for any one in particular; but I have sat on the platform with Mr. Card, when he was not given a chance to speak, and I have know other cases. It is true I have been crowded out myself several times, but it was by the local people who were not called down. I know the same thing has also happened to Mr. McCurdy, and there are others who can talk for themselves. So far as story telling is concerned, if you are a good story-teller, and tell the right kind of a story and tell it for a purpose, it is all right, but I have heard stories that should not have been allowed on the platform.

MR. NAGINEY: I should like to say a word about the County Chairman and printed matter in the county newspaper. I have made an effort to advertise the meetings in our county in this way. I went to one paper and the editor told me they were not living on charity; that "the man who buys your produce might be able to do something for you." Now, how are you going to go about it?

PROF. MENGES: Ventilate such papers thoroughly.

A Member: The women of our county printed the program in the local news for weeks and weeks ahead, and the papers are glad to get it.

MR. NAGINEY: When I had the programs printed, they were glad to get the work; when I went to one fellow, the other man thought he should have some of the work, too. Now, how do you remedy that?

MR. STOUT: I am one of the back numbers, who should have been Oslerized before now, but there is one subject that I want to bring up, and I want to say it in Dutch, so that it cannot be misunderstood. It is about the fellow who steals the other man's thunder. There is one kind of fellow who will read up everything he can find in the bulletins, and they get the first chance to talk, and by the time the other man gets up to talk, there is nothing to say; the first man has stolen his subject. Now that is wrong. Let each man stick to his text. First of all, the institute speaker must know his subject, and beginning at the foundation, he must know the soil, and then he must know the people, and he must use a little commonsense. Advising people in this county where the stones lie so thick on the hillsides, to use a weeder in the potato patch is absurd.

I regard to funny stories, I want to tell you that I would any day rather listen to one of William H. Crane's stories than to a funeral sermon.

MR. WATTS: About advertising the institute: I have never been a County Chairman, so I talk very much from the standpoint of an old maid advising how to raise children. But I believe that personal work counts here, as in everything else. A few days before the meeting, why not go to the telephone and call up your neighbor, and ask him to come to the meeting, and then call up another, and keep it up until you have covered the ground. Then a bunch of post cards will do good work. They cost but little, and can be addressed to every farmer in the district, making just enough difference in them to make them individual. They have been about co-operation, and I believe in it; when we go out as institute leaders, we should co-operate with the County Chairman to make that institute the best that can be had. And when I go out among the people and see a man whose fences are all run down, and who buildings are in need of paint, I want to talk co-operation; it is money and knowledge that he needs to put him on his feet. In regard to encroaching on the other fellow's time, I want to say that on one occasion a lady stole all my time, to the great edification of the audience; she said more in that half hour than I could have said, and said it better.

Now, just a word about stories. I believe in originality, and I do not like to see the originality of a man or woman repressed. Some of us can't help but tell stories. I, myself, will inevitable drift into something humorous before I get through with my speech. But I believe the stories should be all right. There is no harm in a little mirth. I believe we should be careful about boring. We should have a little sympathy with that fellow in the audience. But in our instruction, let us be natural; there will be less chance of boring our audience than if we repress our individuality entirely.

Fig. 1. A Good Type of Market Bird.

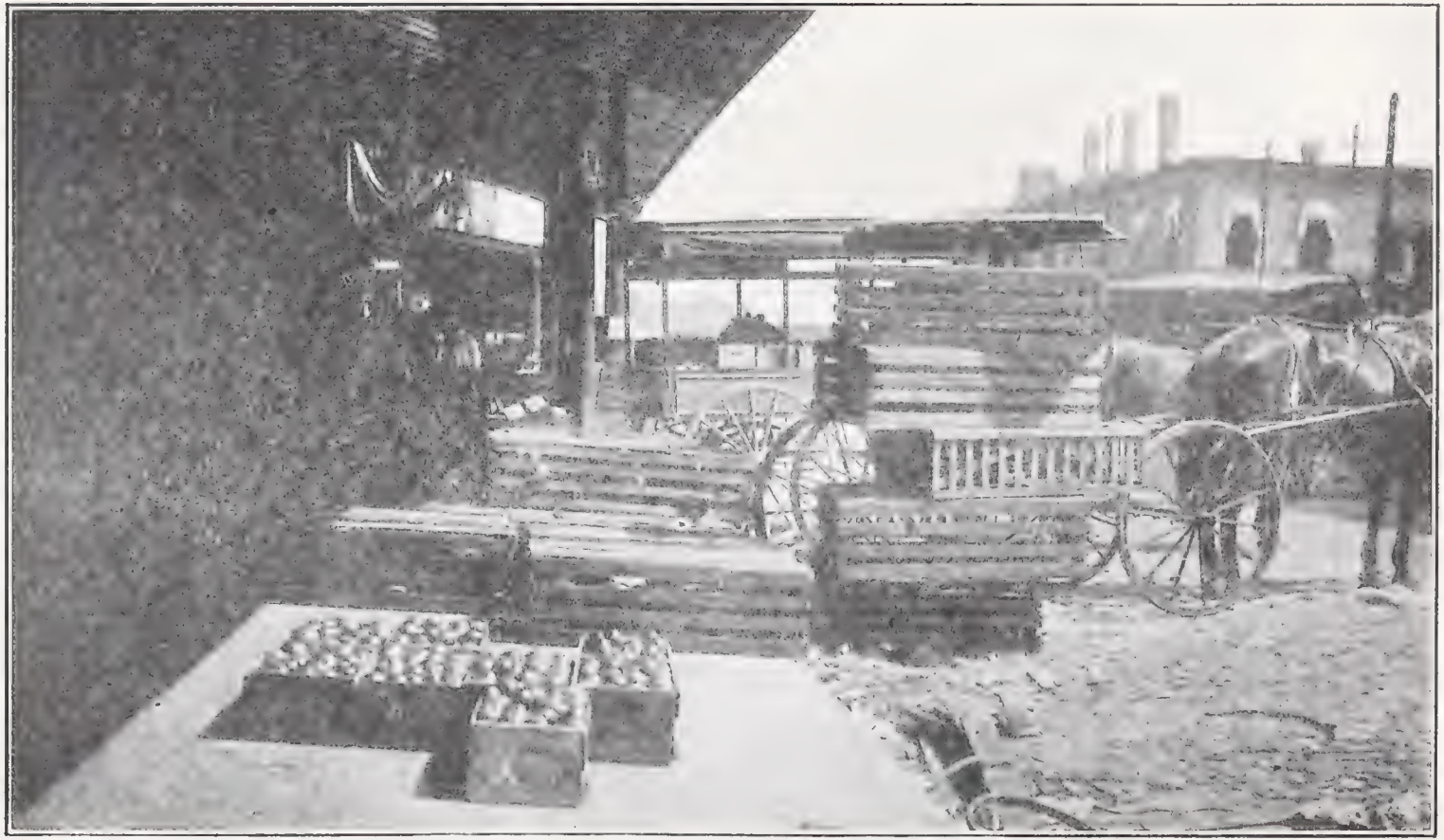


Fig. 2. Coops of Live Poultry in a City Market.

Fig. 3. A Room Where Poultry is Scalded.

Fig. 4. Entrance to a Feeding Station.

Fig. 5. Interior of a Feeding Station.

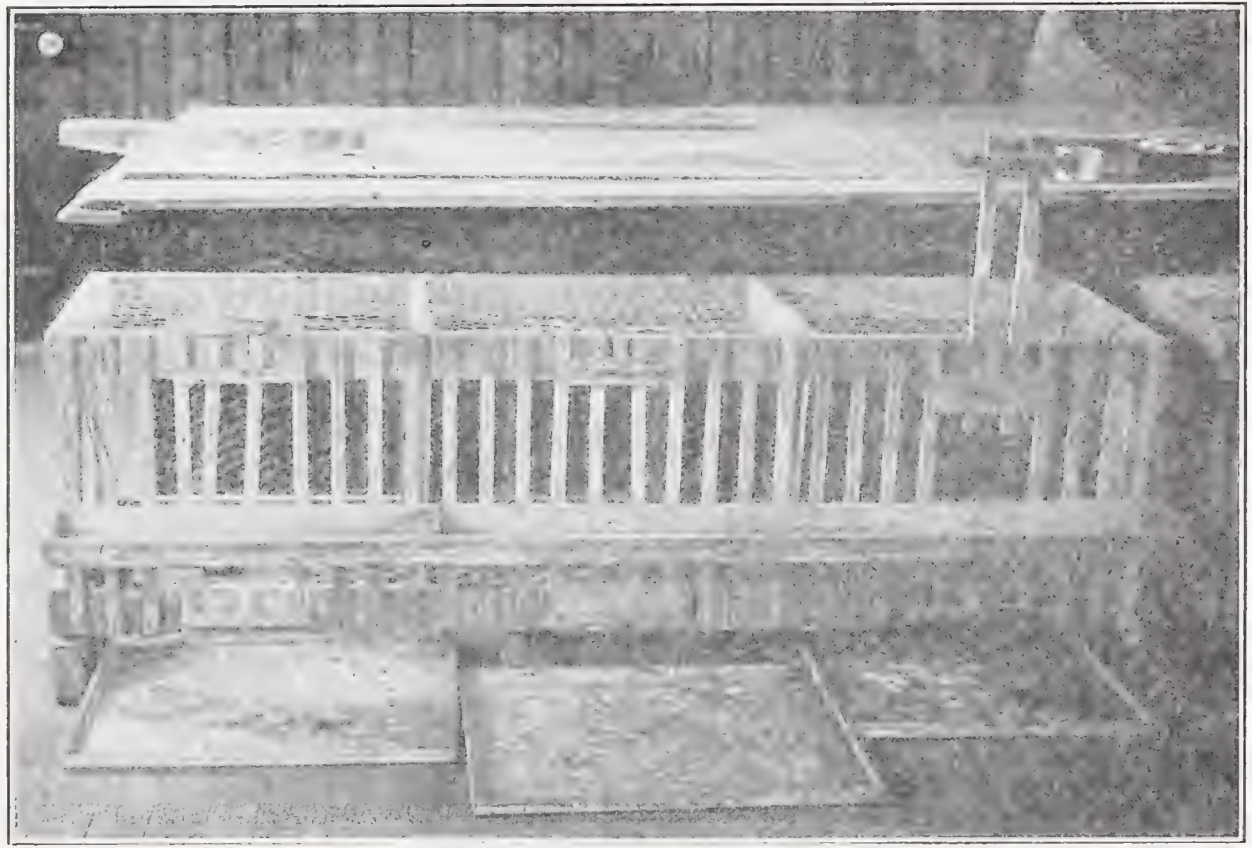


Fig. 6. A Convenient Fattening Crate.

Fig. 7. The Bench Method of Killing Poultry.

Fig. 8. The String Method of Killing Poultry.

Fig. 9. A Dry Picked Bird with Weight on the Head.

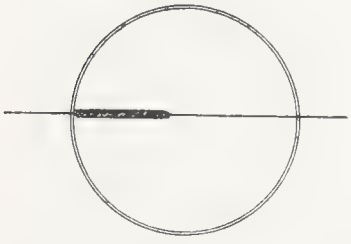
Figure. 10.

A Blood Can.

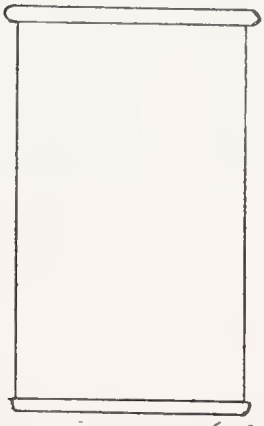
used in.

Dry Picking of Poultry

Inside Elevation



Plan looking down



Outside Elevation

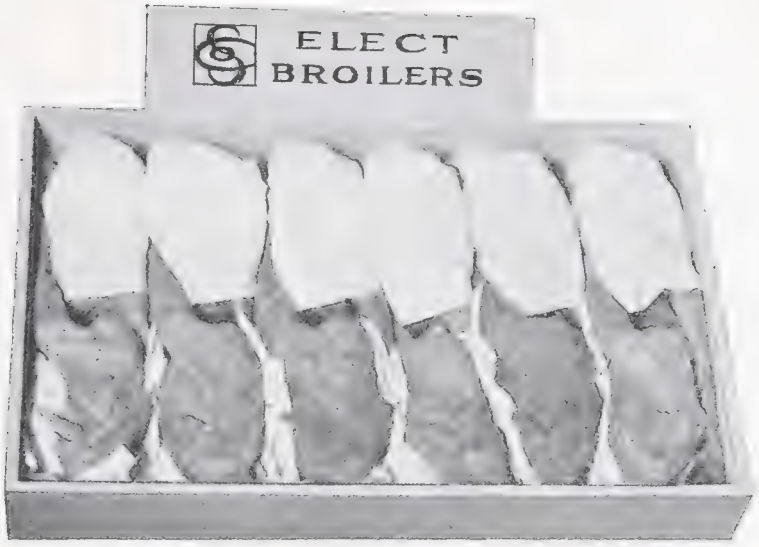


Fig. 11. A Fancy Box of Broilers.

Fig. 12. A Box of Dressed Fowl.

Fig. 13. Penna. State College Poultry Exhibit for the Season of 1911-1912.

MISS THOMAS: May I bring out another thought or two? I believe it is all right for women to be on the force, and I think there should be more women on the force than there are now, but I bespeak for them the courtesy of the men of the section with which they have to travel. These women also have to leave their homes, and make even greater sacrifices than the men do, and there are many ways in which you can make their travel more pleasant. I do not say you should look after their baggage, because every woman should go into the work as a business woman, ready and willing to do her part, but just the ordinary courtesy due to a woman, without any special attention or wagging of the tongue.

One other thing: We have not as much charity and kindness for the other workers of the force as we should have. We are all doing the best we can, and where we fail, I ask for just a little more consideration and kindness, and application of the Golden Rule.

MR. SHUEY: In all the discussion here we have heard very little in favor of the County Chairman. Now, we all know that the Lecturer is well paid, and the County Chairman gets nothing at all. It is hardly right to ask him to neglect his business when he gets nothing for it. He is entitled to be paid for his work as well as the lecturers, I think.

MR. BARNES: In regard to the County Chairman, I believe he gets more than he gives, in every case.

MR. COWAN: I am very glad I am here this afternoon to listen to this discussion, and I am very thankful to our Director for sending to our county the able people he did. I don't know that there has been one word of complaint in our county regarding any one of the people that were sent there. I don't know what the lecturers said when they left us, but I believe our people were thoroughly satisfied, and will be glad to see the same lecturers back again.

Now, so far as local talent is concerned, we have hard work to get local talent, and I think it is a good thing, if not carried to extremes, to interest the people of the community by getting the local talent to take part.

MR. FENSTERMAKER: I don't allow any local talent in my meetings. I don't want it; the people we get are well paid and should know their business, and the audience does not come to hear local talent.

So far as the speakers are concerned, I think we can do better work with fewer lecturers. I learned something from the Movable School.

It is all right to have a little music or singing at the institutes by local talent, but that is as far as I care to go.

DIRECTOR MARTIN: The hour is now six o'clock. I have said very little, because I have been an interested listener. I congratulate myself on one thing: That is that there has not been as much reflection on the State management as there should have been. I realize that there are many obstacles that must still be overcome. Take the question of program; We have tried to get them out so as to meet every need, and it is the best we can do. Take our bulletins for the

past few years. If you will look, you will see that we have outlined the programs there, and you will also see that we advise you not to have more than two speakers to a program, and let them thrash out their subjects thoroughly.

Then regarding the local talent: Ten or fifteen years ago we were very glad to have local talent. I look over this audience and see Mr. Peachey and Mr. Northup, and fifty others. Who are practical farmers, and the strength of the institute, and all of them developed from the local talent. Think of this: Pennsylvania stands out preeminently among the states of the Union as one that has evolved from the ranks of the farmer the teachers and field workers that we have today. Now let us be reasonable; let the County Chairman be careful to select from among the young men and young women who compose his talent the brightest star that he can find—those who have talent that can be developed along the agricultural line,—and then place them on the program immediately following the speaker, and following the same line of thought. Possibly some of the criticism of local talent is a little ill-advised. What has led to this? The local chairman is confronted with the problem of instructing the people, and of entertaining them; but we want the character of that entertainment to be such as will elevate the community, and lift them to higher living in every line of thought. If it were not for our local talent, where would we get our field helpers in years to come?

I want to thank the County Chairmen, before I close this session. Your work is not a perfect one; you are handicapped in many ways, but the most earnest worker we have is the man back on the farm—the County Chairman. You make mistakes, but you are willing to learn. You want to be kind to these men who come to you. You may not always agree with them, but you want to be kind to all of them.

Now, then, another word. Some of you workers when I come to make up the schedule for next year, are going to meet with a disappointment. May I say a word to you, and say it frankly. In order to keep within my appropriation, it will be necessary to cut the institute force from seventy-five to about forty-five or fifty workers. This is not due to any want of respect for any of the workers, but simply because it has to be done. Our funds will not allow us to hold another institute than those given in the schedule, or to furnish another worker, and those of you who are not placed on the roll this year will understand that it is for this reason only. So, in making up your program, I would ask the county chairmen to consult with your people, and ascertain just what subject they are interested in, and then write me, so that we can arrange to give you the speakers to cover those subjects. Will you help me in this way when you go back to your counties?

I want to thank you for the interest shown in the discussions this afternoon. Some of the speeches were a little strong. Some sharp little things have been said. Nothing wrong about that. I would not give much for the person who does not say what they have to say, and say what they think, and then after it is over, shake hands on it, and say "How are you?"

The meeting now stands adjourned until 7.30 this evening; which will be the closing session of this institute.

Thursday, May 23, 1912, 7.30 P. M.

Mr. W. A. Crawford in the Chair.

The CHAIRMAN: The meeting will please come to order. The first number on the progarm is "Some Lessons in Natural History," by Mr. W. H. Stout. This lecture will be illustrated with lantern slides. Mr. Stout will now address us.

(This paper was given Mr. Stout for some revision but was not returned in time when the copy of the Bulletin was given the printer).

The CHAIRMAN: The next number on the program is "Modern Methods of Finishing and Dressing Poultry," by Prof. R. V. Mitchell of State College. This lecture is also illustrated. I have the pleasure of introducing Prof. Mitchell.

Prof. Mitchell spoke as follows:

SOME MODERN METHODS OF FINISHING AND DRESSING POULTRY

By R. V. MITCHELL, State College, Pa.

The fattening and dressing of poultry is a subject which should interest the people of Pennsylvania more than it does. If you people will become acquainted with the markets, you will see much poultry that is in poor condition.

One of the handicaps in the marketing of farm-raised poultry, is that they are usually of mixed breeding. These mongrel chickens vary in size and shape of body and in color of the skin. They do not make an attractive appearance when they are dressed, as they are too uneven in size, shape and color.

Spring chickens can be purchased in many parts of Pennsylvania in October and November for, from six to eight cents per pound. These birds are usually bought by the huckster and shipped live weight to the wholesale dealers in the cities; these dealers in turn sell to the retail dealers.

Most of these birds were in poor condition when they left the farm; and there is no chance for them to be put in better condition after they once leave there, because of the present system of handling live poultry in the East. Old birds may have a large amount of fat on their body and at the same time be very tough. This toughness is due to age and also to the exercise that they get on free range. In order to improve the quality of old birds, it is necessary to crate fatten them for a period of about two to three weeks, before they are killed.

The persons who are making the most out of their poultry are those who are careful to have their birds well fattened, and then place on the market in a neat and attractive way.

I shall show you a few lantern slides this evening which will give some of the methods of fattening and dressing poultry, which are used in the Eastern part of the United States and also in the Central West. I will also show you how to kill and dry pick a live bird.

A good market bird is one that has a good shaped body, good health and the ability to stand forced feeding in close confinement. The body of the bird must be long, and deep and wide, if we have a bird that will dress well and be attractive on the market. Figure (1) shows the type of bird that is desirable for market. If the farmers would mate their flock with a bird of this type and character, they would have poultry to sell in the fall of the year that would bring them profit.

The Barred Plymouth Rock is a type of bird that is especially good for market. The markets demand that poultry shall have yellow shanks and skin; the Barred Plymouth Rocks fill this requirement, besides having the ability to convert food over to chicken to a profit to the poultry feeder. It should be the aim of the poultryman and farmer to select out of his flock for breeding, only those birds that are of a good market shape and then have well shaped bird to head the flock; If this kind of breeding is followed much better poultry will be put on the market.

When poultry is shipped alive to the market it is often subjected to bad handling. Figure (2) shows a number of crates of birds which have been shipped to the city market. These crates are allowed at times to stand in the hot sun for several hours, which results in a loss in weight and also in the death of some of the birds. This is one of the reasons why the returns for a coop of poultry aren't as much as they should be.

There are dealers in the various cities who buy poultry in large numbers and kill and dress them for the local trade. (Fig. 3) shows one of these killing places: Some of these are kept in a sanitary condition, while others are not: In fact, they are filthy. The water used in scalding the poultry is kept in a large vat at the side of the room; several hundred birds are sometimes scalled without changing the water; thus the water becomes very filthy. Men are employed in these places to kill and scald the birds. One of these men will scald and pick about 500 birds in a day. In scalding the birds much filthy water is absorbed by the skin. The skin of scalded birds is easily broken, which furnishes a means for bacteria to enter the carcass and causes it to decompose. After the birds are picked they are cooled either in ice or ice-water. When the birds are allowed to soak for a number of hours in water they absorb several per cent. of it. This practice hurts the keeping quality of poultry. Scalded poultry will not keep in good condition very long on the open market.

The methods practiced in the Central West are quite different from those in the East. As a rule the poultry is shipped to a feeding station. A feeding station is a place where the poultry is fed for a period of ten day or two weeks, so that they will be in first class condition when killed for the market. (Figure 4) shows the entrance to a building of this kind. The birds are weighed and placed in feeding batteries. When one of these batteries is filled it is taken into the room where the feeding is done. Wheels underneath the batteries aid in moving them. (Fig. 5) shows the arrangement of the feeding room. This room is over 300 feet long and has a capacity of 40,000

chickens at one time. The ventilation is carefully looked after. This building has means of ventilation on the sides and also at the roof. You will notice the batteries are made up of four tiers of coops. Galvanized iron pans are used between each tier to collect the droppings. These pans are cleaned out every day and the room is kept very sanitary. A wide aisle is in the center of the room and also between each stand of batteries. A stand of batteries is divided into small pens about two feet square and twenty inches high. In a space of this size, from four to six birds can be confined. The birds are fed from a trough which is hung on the front side of the battery.

The feeding stations are equipped in much the same manner; however, some are more advanced in methods and equipment than others.

The feed that is generally used in feeding consists of white bolted corn meal, low grade flour, oat flour or fine ground hulled-oats and wheat middlings. Buckwheat middlings are good for fattening, but it is difficult to secure them in some sections of the country. All fatteners do not use the same ration, but in the main there isn't very much difference. A very satisfactory ration is composed of

24 lbs. Bolted Corn Meal
6 lbs. Low Grade Flour
1 lb. Wheat Middlings
1 lb. Buckwheat Middlings
1 lb. Pea Meal
1 lb. Oat Meal

Some feeders add tallow to their ration. Better flavored poultry can be secured by not feeding tallow. The ground feeds are thoroughly mixed together and then moistened with buttermilk. About two pounds of buttermilk should be added to each pound of dry feed. This will make the feed of such consistency that it will pour out of a bucket. The birds should be starved for twenty-four hours before beginning the feeding process. This is to get the bird well emptied out, before starting on a new feed. The first four or five feeds should not be more than one-half as much as they will eat; at the end of this time they can have all they will clean up in about twenty minutes. The birds are usually fed twice a day. The maximum gains can be secured in about ten days to two weeks as a rule. It is unprofitable to feed for a longer time than two weeks. Water should not be given the birds unless in very hot weather. In feeding for this length of time it is not necessary to supply any grit or green food. Much better results can be secured with buttermilk than with skim milk. The mixing of the feed in these houses is usually done by power mixers, and in this way the labor is made as light as possible. Poultry feeders can secure a gain of 25% to 35% on birds in two weeks.

From these various methods, every man who feeds poultry can get something which will benefit him. (Fig. 6) shows a fattening crate which can be successfully used by the man who produces poultry on a small scale. This crate is six feet long, twenty inches wide, and twenty inches high. It is divided into three apartments each two feet long. The front is made of lathe placed about two inches apart. The top, back and ends are made of inch mesh wire netting. The floor of the coop is made of inch mesh woven wire netting, number nine wire being used. The wire makes a very satisfactory floor, because the droppings pass

thru to the galvanized iron pans underneath, and the birds are kept in a sanitary condition. The birds are fed from the trough on the front of the coop. This coop is easy to construct and will hold from fifteen to twenty birds at one time.

The quality of the poultry fed by this method is much superior to the ordinary run of poultry. The fat is well distributed thru the muscle tissue, the meat is juicy and tender, and the birds present a good appearance on the market.

After the poultry has been fed for two weeks they are starved for twenty-four to thirty-six hours. This is to get the body rid of all waste products. During this time they are allowed to have water to drink. I will now show you some of the methods used in the dressing of the birds. (Fig. 7) shows what is known as the bench method of picking. The operator takes the bird from the coop, fastens its head to a sharp hook on the side of the bench; with one hand the bird is pulled back over the bench, and with the other hand the blood vessels in the neck of the bird are cut and the brain is pierced so that the feathers loosen and can be pulled out easily. You can see the feathers are pushed in front of the operator into a large box. The blood drains thru a hole in the bench into a pail. The bench is covered with a cushion made of canvas cloth and some filler. This is to keep the body of the birds from getting bruised. This method is objectionable because the cushion becomes very unsanitary unless it is changed often. It is also the cause of breaking the delicate skin on the outside of the bird and when the carcass is cooled it gives a bad appearance and also affects the keeping quality of the bird.

Another method that is used extensively in poultry houses is what is known as the string method. (Fig. 8) shows a room where this system is practiced. One end of the string is fastened to a rod or joist overhead. An iron nut is fastened to the end. The bird is taken out of the coop and held in the left hand. The string is held in the right. The legs of the bird are placed against the string; then the end of the string is passed up over the legs and to the right side of the string. You will find the nut holds the string securely on the bird, for the weight of the bird pulls it against the string and the legs.

The bird is killed by cutting the veins in the neck and piercing the brain. The usual practice is to hang a weight on the bird's head to keep it in a more rigid position until the blood is drained out. This is shown in (Fig. 9). This method has some good qualities. The bird is held in the best position to get good bleeding. There is not so much danger of breaking the skin as in the bench method. But where this method is practiced it is often unsanitary for there is nothing to collect all the blood as will be seen in (Fig. 9). (Fig. 10) shows a can five inches high and three inches in diameter. It is made of galvanized iron and is weighed so that it will weigh about one pound. Inside the can one and one-half inches from the top is a hook which is soldered to the side of the can. This hook is to hold the can to the birds head. As soon as the bird is killed this can is put over the head to catch the blood and to keep the bird in a rigid position. If this can were used by those who use the string method, their rooms could be kept in a sanitary condition. You can readily see that when this can is used, that the string method is the most satisfactory.

The man who kills the birds removes the body, wing and tail feathers. This is what is called roughing the bird. For this work he is paid one cent each. Experienced men are able to rough from four to six hundred birds in a day. Those birds are passed onto men and women who remove the pin feathers. It requires about six pinners for one first class rougher. For this work they receive about a cent and a half per bird. After the feathers are all removed the feet and heads are thoroly washed. The birds are then hung by the feet on racks to drain off. These racks are mounted on trucks and are made V shaped to allow the birds to drain off without dripping on each other. After the birds are drained the heads are sometimes wrapped in paper. This keeps them more sanitary when they are packed for shipment, and gives them a neater appearance on the market. The truck load of poultry is then run into a room with a temperature of about 38°. The birds are allowed to stand there for twenty-four to thirty-six hours or until all the animal heat has left the body. Then they are graded according to size and quality and are packed in boxes which hold one dozen each. (Fig. 11) shows a box of birds that weigh twenty pounds to the dozen. Not that each bird is wrapped in paper and that the head and feet are not exposed to view. You will observe that the birds fill the box snugly so that they do not bruise in transportation.

Fig. 12 shows a box of old fowls. These weigh about sixty pounds to the dozen. The feathers on the tip of the wings are left on the old fowls. Note that the box is lined with paper, but the birds are not wrapped as these in (Fig 11). The packed birds are put into storage rooms and frozen. They are held in this way until they are sold on the market. Refrigerator cars are used in shipping these birds.

A great many feathers are collected in these killing establishments. The coarse feathers are kept separate from the body feathers. These are washed and dried and when they are put on the market, they bring from five to twenty-five cents per pound.

Fig. 13 shows a lot of dressed poultry that was exhibited at Williamsport, Philadelphia, and Pittsburgh this year, by the Pennsylvania State College, State College, Pennsylvania. The birds used in this exhibit were bought from the farmers and were a mixture of Barred Rocks, White Wyandottes and Rhode Island Reds. The birds were divided into lots of ten each. The lots weighed practically the same at the start. Several lots were fed whole corn and wheat, which is the usual feed used to fatten poultry by the majority of people. The gains on these lots were one to two pounds in three weeks for ten birds and the cost per pound gain varied from thirty-three to sixty-six cents. Farmers will sell these birds at six cents to ten cen per pound—or for less than it cost them to produce a pound of chicken.

Similar lots of birds were confined in crates and fed a mixed of bolted cornmeal, low grade flour, wheat midds, buckwheat midds; all of which were moistened with buttermilk. In the same length of time these birds had gained ten pounds per lot of ten birds, and the cost per pound of gain was as low as five to seven cents. Birds that are fed in this way can be sold for a better price because there is quality and quantity to a milk fed bird. This kind of feeding will be profitable to those who practice it.

There are two things necessary in the dry picking of poultry. One of these is to stick the bird in the right part of the brain, in order that

the muscles which hold the feathers in the skin will relax and the feathers can be pulled out easily. The other is to cut the blood vessels in the neck in order to insure good bleeding. A knife suitable for this work is one with a narrow blade about two inches long. A good knife can be made by grinding down an old silver case knife. The head is held in the left hand between the thumb and forefinger. The cut for bleeding is made just back of the bony part of the head. The knife is thrust into the bird's mouth to the left side of the neck and a diagonal cut is made which severs the two main blood-vessels in the neck; this will cause the blood to flow freely.

The brain is pierced by starting the knife at the corner of the mouth on the left side of the head at such an angle that the point will pierce the brain about the center of the head and back of the eyes. This will cause the muscles to relax and the feathers can be pulled out easily. When the brain is pierced the bird is made insensible.

In removing the feathers, take first, those from the breast, second, those from the back, and leaving the tail and wing feathers for the last.

The poultry producers of Pennsylvania must use better methods of finishing and dressing their poultry, if they receive the benefits of the good markets of the State.

I thank you for your attention.

A Member: Is it sanitary to wrap the head of the bird in this way?

PROF. MITCHELL: Yes; the head is thoroughly washed before it is wrapped in paper.

A Member: Do all the markets demand this dry picking?

PROF. MITCHELL: Some markets demand dry picked poultry while others want scalded poultry. But the best markets require dry picked poultry.

A Member: Would it be safe to allow them to be shipped in that way, if they have not been starved?

PROF. MITCHELL: The birds that are not starved before they are killed will not stand shipping so well as those that are well starved.

MR. PERHAM: How can they grow them cheaper in the West than here?

PROF. MITCHELL: Because they are able to get a greater range—more insects—and cheaper feed. The land produces grain crops without the use of fertilizers.

MR. SEEDS: How about feeding sand?

PROF. MITCHELL: Sand is used sometimes to increase the weight of the birds—shelled corn is sometimes used for the same purpose.

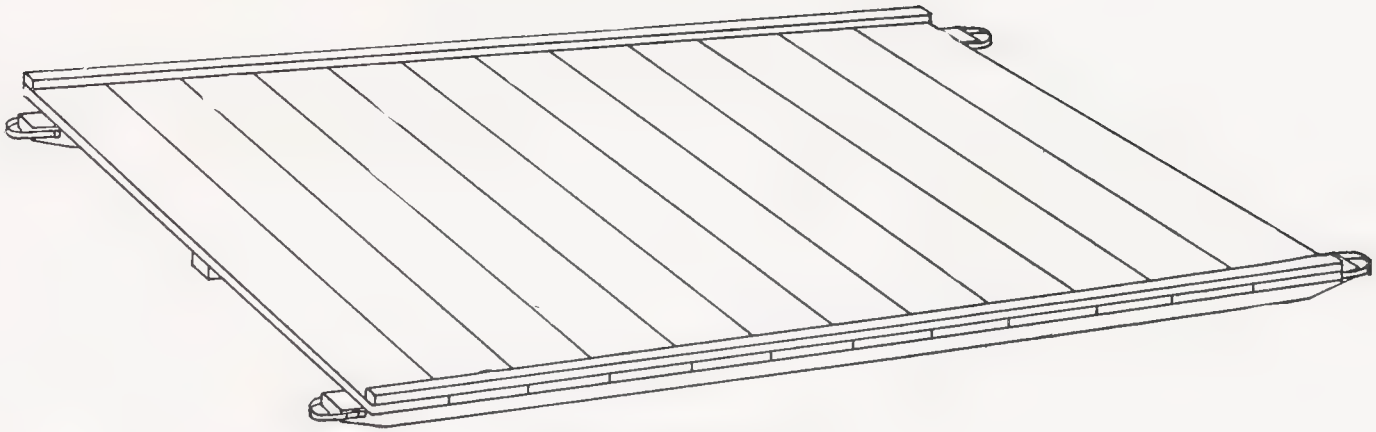


Fig. 1. Mixing Platform.

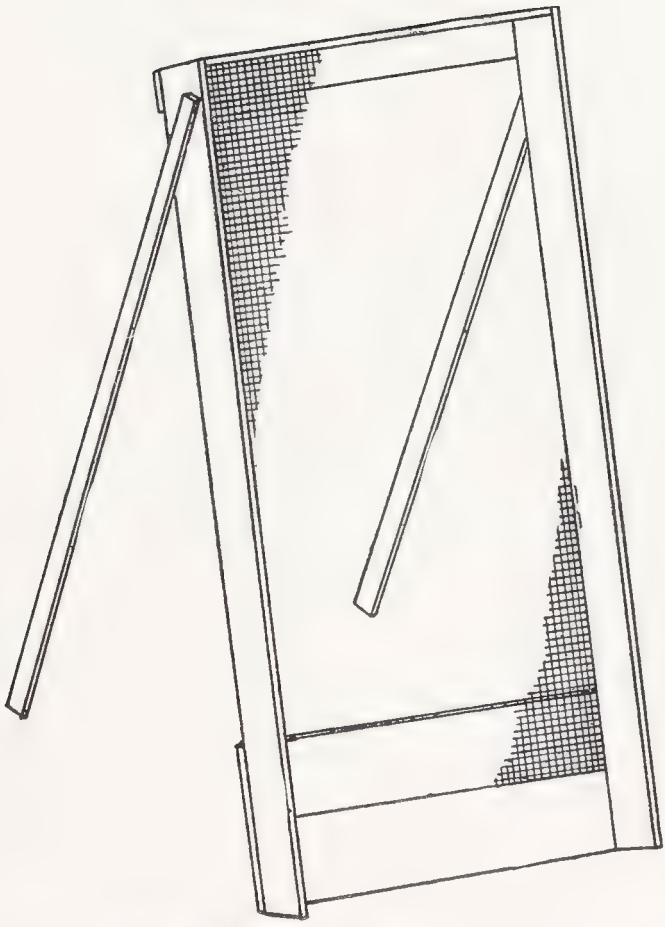


Fig. 2. Sand Screen.

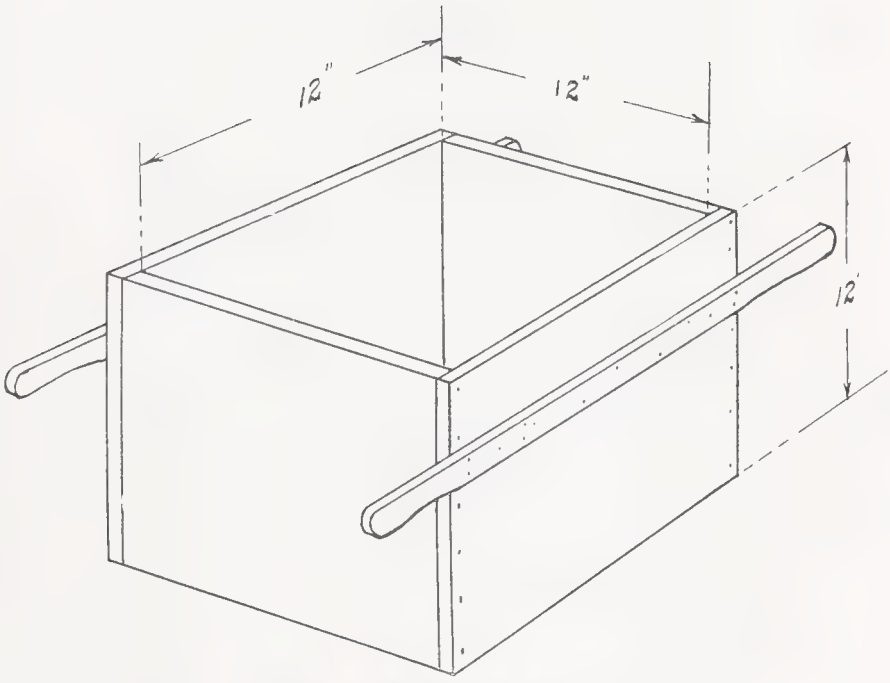


Fig. 3. Measuring Box.

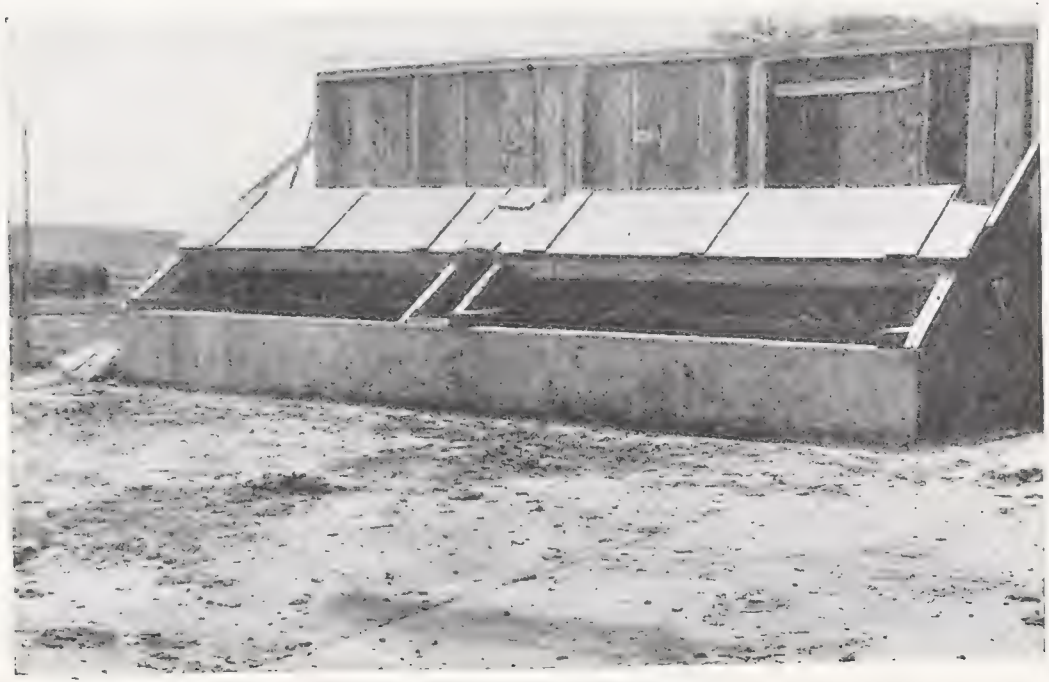


Fig. 4. Watering Trough.

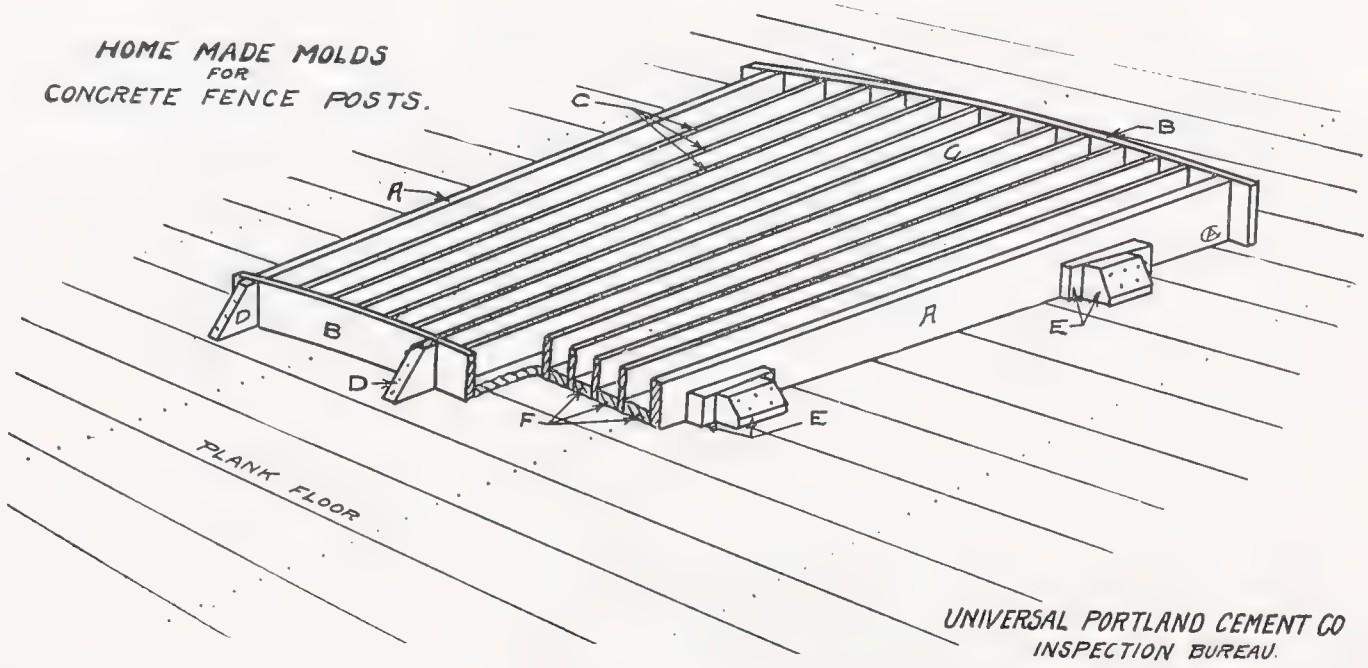


Fig. 5. Home Made Mould.

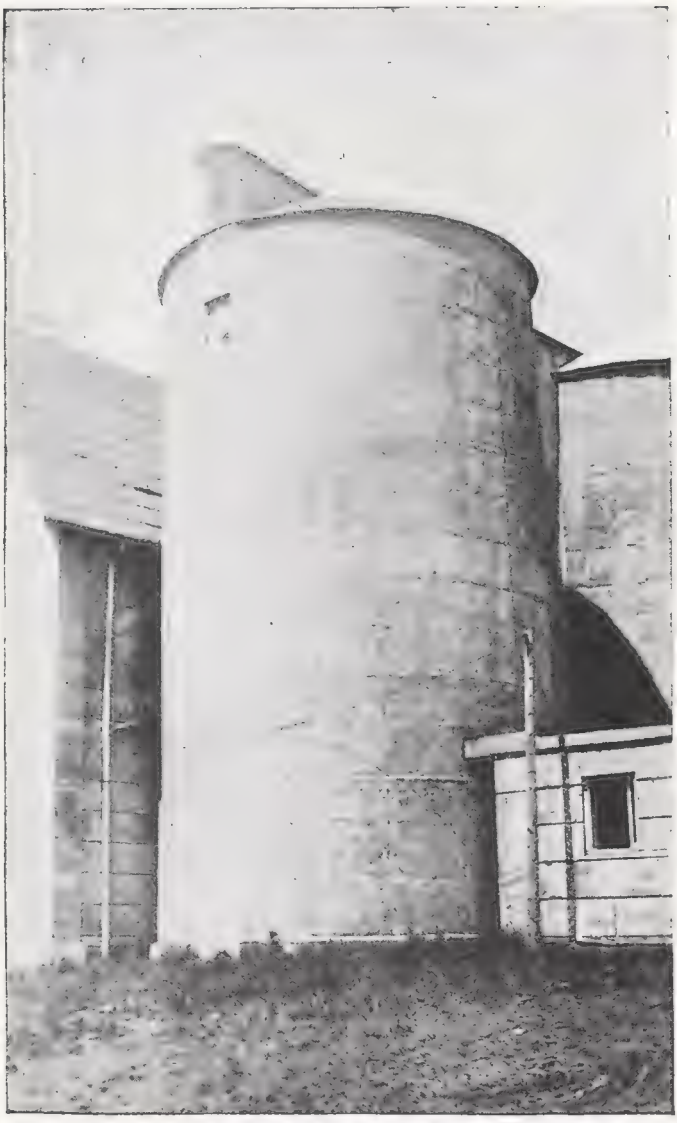


Fig. 6.—Monolithic Silo.

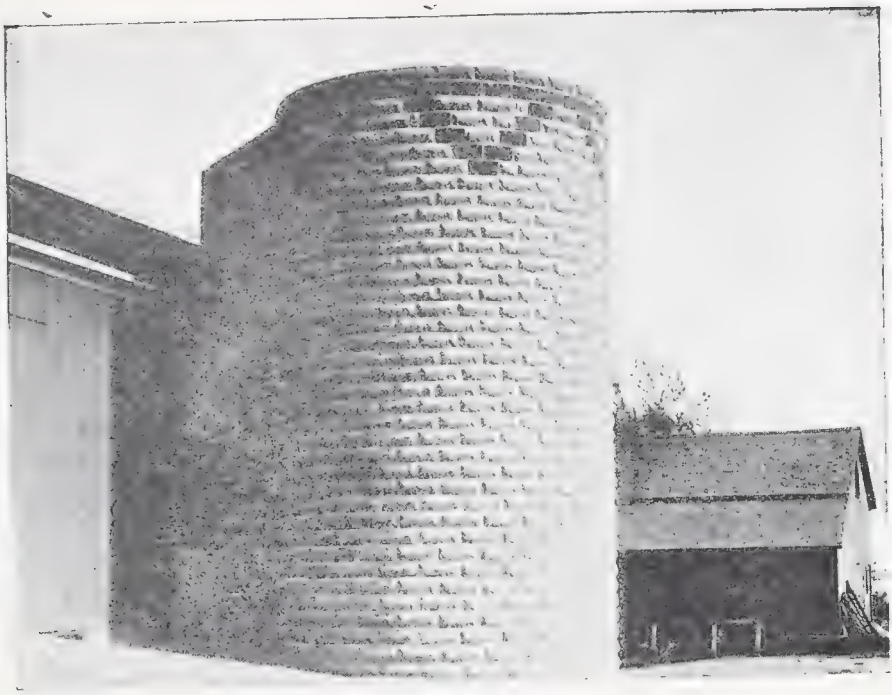


Fig. 7. Concrete Block Silo.

Fig. 8. Concrete Milk House.

Fig. 9. Concrete for Making Fireproof Buildings.

Fig. 10. Monolithic Concrete Dairy House.

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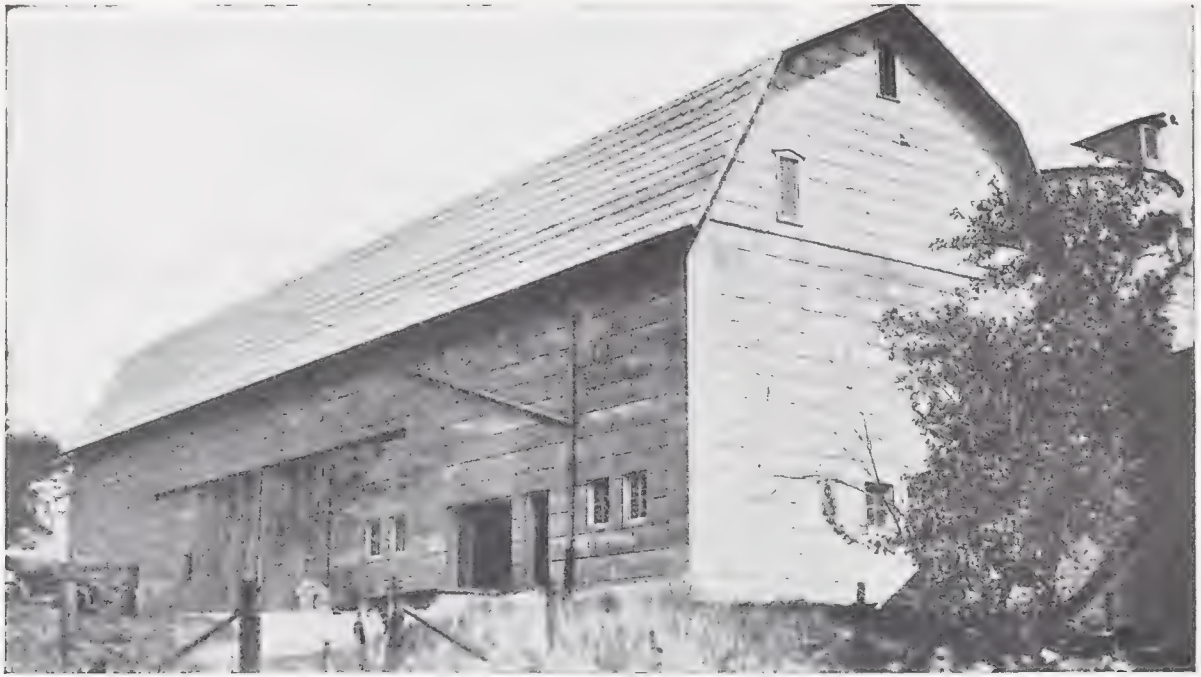

Fig. 12. Monolithic Concrete Dairy Barn.

A Member: You talk about chickens on the range not being of as good quality when it comes to meat; do they keep just as long as those that are fed in the coop?

PROF. MITCHELL: They will keep just as long but they will not be of as good quality.

The CHAIRMAN: We will now listen to the report of the Committee on Resolutions:

Prof. Menges read the following report of the Committee on Resolutions:

REPORT OF THE COMMITTEE ON RESOLUTIONS

We, the Committee on Resolutions, in order to express the appreciation of the Normal Institute for the cordial welcome and entertainment by the City of Towanda, and to recommend such action as we deem for the best interests of the Farmers Institutes and allied institutions of the State, do hereby suggest the adoption of the following resolutions:

1. *Resolved,* That we hereby express our sincere thanks for the courteous welcome extended us by the County Chairman of Farmers' Institutes, Mr. F. D. Kerrick, President Judge Maxwell of the Courts of Bradford County, President Kuykendall of the Bradford County Agricultural Society, to G. E. Frost, Burgess of Towanda, and to the Local Committee of arrangements, through whose efforts ample provision for our entertainment was made, and to the citizens of the town who have opened their homes for our comfort, and the papers of the town which have reported our proceedings, and to the Opera House Company for the use of this commodious building.

2. *Resolved,* That we extend to the Manager of Farmers' Institutes, Hon. A. L. Martin, and to the Secretary of Agriculture, our sincere thanks for the expert instruction given during the various sessions of this Normal Institute.

3. *Resolved,* That we endorse the efforts of the associations and organizations which have for their object the practical instructions and bettering of the financial and social conditions of the farmer.

4. *Resolved,* That we, the members of the State Board of Agriculture, here present, the County Managers of Farmers' Institutes and the Lecturers of Farmers Institutes, and visitors, in annual assembly gathered, do hereby request that the Legislature at its coming session appropriate $75,000 for the Farmers' Institute work for the coming two years, and that a further appropriation of $30,000 be made for practical demonstration work throughout the various counties of the State by the department of the Farmers' Institutes.

5. *Resolved,* That we request the County Chairmen or County Managers of Farmers' Institutes of the various counties of the State, that if it should be deemed necessary by the Secretary of Agriculture, or the Manager of Farmers' Institutes of this State, in order to secure the appropriations asked, for financing the var-

ious Bureaus of the Department as well as the appropriations asked for by the State College and Experiment Station, that they should, or such citizens of their counties should, come to Harrisburg to have a hearing before the appropriations committees to secure these appropriations, they shall do so.

6. *Resolved*, That we endorse the co-operative movement, and urge the members of the Normal Institute to use their influence in assisting farmers' organizations in their counties in encouraging such movements.

Respectfully submitted,

(Signed) R. P. KESTER,
FRANKLIN MENGES,
H. M. GOODERHAM,
S. C. GEORGE,
T. J. FERGUSON.

The CHAIRMAN: What shall be done with this report?

MR. COWAN: I move it be adopted as read.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: The next number on the program is an address by a young man who was born on a farm in the corn belt of the Middle West; he will now talk to us on "Farm Buildings Built of Concrete," which will be illustrated with lantern slides. I now have the pleasure of introducing to you Mr. E. S. Fowler of Chicago, Ill.

Mr. Fowler spoke as follows:

FARM BUILDINGS BUILT OF CONCRETE

By E. S. FOWLER, Field Agent, Universal Portland Cement Company, Chicago, Ill.

The several speakers this week have told you how to grow better fruit, how to raise better grain, how to breed better horses, how to improve the dairy herd and how to improve the soil. After these products have been grown it is a significant fact that buildings will be needed to store and house them.

In the past most of the farm buildings have been inadequate, illy arranged, ugly and inconvenient, instead of being money savers they have been money spenders. To some extent the same condition still exists but through the science of Agricultural Engineering we may expect the solution and correction of this building waste, which will add to the profits of the farmer. It is from the standpoint of an agricultural engineer that I wish to discuss the subject assigned me this evening—"Farm Buildings Built of Concrete."

Permanent and fireproof structures are more and more demanded by farmers and why should they not demand these just as well as producers of other commodities demand them and find them economical.

High prices, poorer quality, and the scarcity of lumber are compelling the prospective builder to turn to other materials.

Concrete is a comparatively new building material which few farmers have acquired the habit of using, mainly because they do not understand it and imagine that to construct all buildings, fences, walks, floors, tanks, troughs, etc., is impracticable. The progressive farmer of today, however, is beginning to realize that concrete is the natural building material adapted to farm buildings, and for this reason he is studying its characteristics and uses.

The success of any concrete building or structure depends firstly, upon the quality of the concrete that goes into it, and secondly, upon the workmanship. A great deal has been written on how to build with concrete, but very few practical instructions have been given to the farmer on how to manufacture it. With your permission I would like to digress from the subject of this evening for a few minutes, and call your attention to the essential points of good concrete.

Concrete may be defined as an artificial stone made by mixing together cement, water and inert materials consisting of large and small particles such as sand, gravel or crushed stone. In doing this it must be remembered that the user of cement in making concrete is not only a builder, but a manufacturer, and as such he must understand the materials he is using, must exercise judgment in their selection and must handle them properly in order to obtain the best results economically.

PORTLAND CEMENT

Portland cement is a carefully manufactured compound which is sold in a condition to act immediately when mixed with water. It is usually packed in cloth or paper bags weighing ninety-five pounds each, four such bags making a barrel of three hundred and eighty pounds. Portland cement is somewhat like lime, in that it attracts moisture, and for this reason must be carefully protected when stored. If it gets damp or wet it becomes lumpy and hard. If these lumps become so hard that it is impossible to crush them easily, it has become worthless so far as a cementing material is concerned. Crushing these hard lumps to powder will not restore life to the cement, for in changing from a powder to a solid state, the same change has taken place as when cement, water and gravel or stone are mixed together, forming concrete material. As this action of hardening of cement can take place but once, it can readily be seen that the cement must be properly protected until ready for use.

AGGREGATES

The inactive materials which are mixed with cement and water to form concrete are called aggregates. The aggregates are generally divided into two classes, fine aggregate and coarse aggregate. The fine aggregate is usually referred to as that part of the material which will pass a screen having $\frac{1}{4}$ inch meshes, and generally consists of sand but may also consist of gravel or stone screenings. The coarse aggregate consists of material larger than $\frac{1}{4}$ inch, and may be gravel, crushed stone, or in fact, any hard, durable material. The aggregate must be clean, coarse, hard, durable and well graded. Clean, because if the sand grains or pieces of gravel or stone are covered with a film or coating of clay or loam, the cement cannot perform its duty

in cementing the particles together. The sand should be course and well graded that is, consisting of particles ranging in size from coarse to fine, the larger sizes predominating. Such a sand is usually solid and compact, and requires a minimum amount of cement to coat the particles, and fill the voids or air spaces between them. A fine sand is sometimes used by the operator who is not entirely familiar with the proper selection of aggregate, but it requires more cement for a given strength and more thorough mixing, and therefore is not economical to use.

The aggregate should be hard and durable, hard because the concrete cannot be any stronger than the strength of the sand and stone which goes into its make-up; durable, because the sand, gravel or stone should remain hard. The size of the coarse aggregate depends largely upon the character of the work in which the concrete is to be used. It should always be such as will enable the concrete to be readily placed in the form and leave a reasonable smooth surface.

For plain concrete work, one-half the thickness of the wall of the structure is often given as the maximum size of the coarse aggregate, but for the best concrete the coarse aggregate in no case should be larger than $1\frac{1}{2}$ inches.

PROPORTIONING

An ideal concrete mixture is one in which all the spaces (voids) between the pieces of gravel or crushed stone are filled with sand grains, and all the spaces between the sand grains are filled with cement. As such a mixture is hard to obtain on account of the variation in amount of voids in each load of sand or gravel, it is always better to be on the safe side and use a little more cement than required to fill the voids. From the definition of concrete we find that it is composed of water, cement, fine and coarse aggregate. Before deciding upon the relative amounts of these several materials used in making concrete, we must first consider the kind of work we intend to do. For instance, such work as tanks, silos, troughs, cisterns, etc., where solid, dense and watertight concrete and considerable strength are required, we should use about twice as much gravel or crushed stone as sand, and about twice as much sand as cement. This would be called a 1:2:4 mixture, that is to say, one part cement, two parts sand and four parts gravel or crushed stone. For ordinary work, such as foundation walls, sidewalk bases, barns or feeding floor bases, a leaner mixture could be used, say ($1:2\frac{1}{2}:5$), one part cement, $2\frac{1}{2}$ parts sand and 5 parts gravel or crushed stone. The materials used in making concrete should always be proportioned accurately by volume and in sack batches. As one sack of cement is usually considered as one cubic foot, it will be found convenient to proportion the aggregates in a measuring box of one cubic foot capacity.

NATURAL BANK GRAVEL

Sand and screened gravel or stone, as found in natural banks, are doubtless the most popular aggregate for concrete work, as they can be obtained in nearly every locality. They are, however, rarely suitable for concrete purposes as found in their natural condition, there being too great proportion of fine aggregate. As explained above, that the most economical concrete mixture was one that contains about twice as much screened gravel or stone as sand, it is therefore,

advisable to examine or test natural gravel before using, and if the proportion of sand and stone are not approximately correct, the two materials should be separated by screening, and remixed in proper proportions. In some cases it may be found cheaper to use a larger amount of cement with the material as it comes from the bank than to separate the sand and gravel, and remix in proper proportions.

MIXING

Mixing of materials for concrete work should always be done on a level, watertight platform. It will be found convenient to proportion and mix the materials in equal sized batches. This is usually taken in cement sack units, one bag of cement being considered as one cubic foot. The sand is first measured accurately by means of a measuring box, and spread in an even thin layer over the plat form. The cement is added and the two materials mixed thoroughly dry until of a uniform color, spread out again and the screened gravel or crushed stone added and again all mixed dry until of a uniform color. The mass is then shoveled up in the form of a cone and the top made cup-shape. The water is then poured into this cup-like receptacle and allowed to settle down into the mass. The entire mass is then mixed thoroughly until of a uniform wetness or consistency. If the water is applied down the sides of the pile, it is very liable to flow off, washing the cement from the particles of sand and stone.

Concrete should be deposited in its final resting place within thirty minutes after the water is added, as at this time the action of hardening begins, and if the concrete is disturbed serious results are very liable to occur.

CONSISTENCY

The wetness or consistency of the concrete when deposited in forms will depend largely upon the character of the work being done. Whenever possible, it is advisable to mix the concrete to a medium wet consistency, or one that will permit puddling or churning with a pole, thereby working the concrete thoroughly into the form. It is impossible to get a satisfactory concrete if it is mixed so dry that excessive tamping is required in order to fill the forms properly. Concrete should not be mixed with so much water that when it is deposited in the forms the stone and gravel will have a tendency to settle to the bottom, as the water will have a tendency to rise to the top and carry with it a large amount of the cement and fine particles of sand. This causes a separation of materials and if the forms are not watertight the water will flush out and carry with it the cement, and the result is a weak, lean concrete.

TOOLS AND EQUIPMENT

The tools and equipment used in the manufacture of concrete, as required by the farmer in ordinary work, are easily obtained and inexpensive. Aside from those that may be homemade the remainder are tools which are used on the farm for other purposes.

A mixing platform (Fig. 1): a sand screen (Fig. 2); measuring box (Fig. 3); a water barrel; several water buckets; wheelbarrows, at least two, and preferably of metal bodies; square shovels, one to each man.

Perhaps one of the most common ways of using cement on the farm is making concrete watering troughs. Fig 4 shows a photograph of a concrete watering trough on the farm of Mr. John Stewart, Elburn, Ill. Mr. Stewart has his entire barnyard cemented over with concrete, thus saving the most valuable part of the fertilizer for his fields. An experiment performed by the Ohio Experiment Station and reported in Bulletin No. 183, proves that a concrete floor in a yard where cattle are fatted will pay for two-thirds its cost in six months time.

Another practical application of concrete construction about the farm is found in the use of concrete posts. This includes posts for line fences, gates and corners, clothes lines, mail boxes, lamps, signs, hitching posts and vine supports. The advantages of using concrete posts in reference to any other kind are so apparent that they need scarcely be mentioned. Probably the most important consideration is their permanency, and it is no exaggeration to say that a properly made concrete post with proper usage will last forever; it will neither rot, burn or corrode. Scarcely less important than durability is the matter of cost. Fortunately concrete posts can generally be made within the cost of wooden posts and in many localities at a considerable saving.

Figure 5 illustrates a simple home made mold for making posts 7 feet long, 3 inches square at the top and 5 inches square at the bottom. This makes a tapering post which is to be greatly preferred for fastening wire fences. In fasting a wire fence to this kind of a post, tie the line wire to the post with a short piece of light wire in a manner similar to that used in fastening telephone wires to insulators. The tapering shape of the post thus prevents the wire fence from being crushed down by stock. To guard against hogs raising the fence, make notches in the corners of the posts with a chisel, so that the tie wire, will be held securely in the notches, thus preventing the line wire from being moved.

Figure 6 shows a view of two monolithic silos on the Beach Farm, Coldwater, Mich. A silo of this constructed is the more economical and durable when properly constructed than any other silo. Another type of construction is that of concrete blocks. Figure 7 shows a photograph of a concrete block silo on the farm of Mr. Fred Ludke, East Troy, Wis.

The concrete block milk house shown in Figure 8, is on the farm of Mr. A. J. Strong, Elkhorn, Wis. This building is 8 x 10 x 9 feet, inside dimensions. The roof is made of cement asbestos shingles. The total estimate cost of this structure complete is $200.00.

The value of concrete for making fireproof buildings is illustrated in Figure 9. This figure shows a view of the charred remains of Mrs. Scot Durand's Dairy Barn at Lake Bluff, Ill., which was destroyed by fire with many other frame buildings on her farm. The concrete floor in the dairy barn was the only part of this structure that escaped destruction, and the monolithic concrete dairy house (Fig. 10) shown in the rear was the only building left standing. This building remained practically unharmed. It is 14 feet x 18 feet and cost $188.00.

CONCRETE BARNS

The practice of building barns entirely of concrete is increasing from year to year because of the fact that they are the most durable, fireproof, verminproof, sanitary and economical when maintenance and lasting qualities are considered.

Figure 11 is a design of a concrete barn made for Mr. Forest Henry of Dover, Minnesota. This design can be constructed with either monolithic concrete or concrete blocks. The pilasters in the outside walls, together with the interior columns support the cross beams "B" which in turn carry the reinforced concrete haymow floor as shown in section "AA" in figure. The monitor roof "G," its walls "H" and part of roofs "F" are carried by beams "D" which are supported by columns "C." The depth of foundation depends upon the locality; it should always extend below the frost line which prevents settling due to freezing. The plan in this design shows the stock standing in stalls facing the outside wall. Points in favor of this arrangement are that it gives them plenty of light and does not require them to stand in their own shadow; this position is also an advantage with regard to ventilation. Because the fresh air coming through the intakes in the outside wall and discharging at the ceiling, falls to their faces first and is inhaled before it has a chance to mix with the foul odors of the barn. The impure air is removed from near the center of the barn through the out-take flue, extending through the haymow and exhausting into the outside air above the peak roof. Another point in favor of this plan is that it has a driveway 9 feet wide between the gutters in the cow stable part, and 12 feet wide elsewhere, extending through the entire length of the building. This makes it possible to drive through the barn, load the manure from the stables onto the manure spreader, and haul it directly to the fields, thus saving the fall strength of the barn litter for fertilizing.

The estimated bill of materials required for the construction of this barn entirely of concrete is

9764 concrete blocks.
363 cu. yds. monolithic concrete;
24885 lbs. of steel for reinforcement.

The total estimated cost of this barn, including labor for construction, would be approximately $4,800. To construct a barn similar to this with lumber it is estimated it would cost completely approximately $4,000. Further, by comparing these two costs it is found—taking into consideration the cost of maintenance, insurance against lightening and fire, and the interest on the investment—the concrete structure (because of no maintenance and insurance charges) will equal the cost of the lumber structure in five years, after this time the concrete barn will be a saving proposition.

Figure 12 shows a view of a monolithic reinforced concrete dairy barn, located on the Beach Dairy Farm, Coldwater, Mich. The walls of the barn are marked to imitate concrete blocks.

A barn built entirely with concrete will give you the most durable, fireproof, verminproof, and sanitary structure that it is possible to construct. It will give you a barn with no comparison or equal for its purpose or cost. It will give you a barn that is pleasing in architecture, yet efficient, serviceable and economical when lasting quali-

ties are considered. The outside walls which in ordinary barns are plain and harsh in appearance, in the design above are broken and relieved by artistic pilasters stretching to the roof that makes the general perspective very attractive. Where block construction is used, blocks made of different colored aggregate may be used for decorating purposes if desired. Besides these features a concrete barn will make a warm, dry, comfortable and healthful abode for stock in winter, and the coolest structure possible in the summer. There need be no fear of blowing straw or any other dusty storage into the loft of such a barn, for neither dust on the inside nor moisture on the outside affects concrete; neither will there be the constant expense of painting and repairing as with a wooden structure, because concrete has been proven to have greater resisting properties to the elements than any other material, and its life is everlasting.

In conclusion, I believe you will agree that by a careful study of the methods of concrete construction a farmer can be his own inspector, and that with common day laborers to assist him, he can construct buildings with cement at a cost which is the same as, or even less than with lumber. This is due to the fact, as stated before, that lumber has become poorer in quality and higher in price, and that it requires higher salaried men to work it.

Program of the evening being completed the meeting was ajourned by

A. L. MARTIN,
Director of Institutes.